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ON SOME POINTS OF CHEMICAL THEORY, ON THE AMMONIA- AND AMMONIUM-BASES, AND ON THE NATIONAL PHARMACOPŒIA;

being Extracts from the Introductory Lecture, delivered before the Class of Jefferson Medical College, of Philadelphia, October 14, 1858. By Franklin Bache, M. D., Professor of Chemistry in the College.

It is well known that the ponderable elements have fixed combining weights, called their equivalents, which form a chain of ratios, representing the proportion in which they unite with one another. This fixedness of the combining ratios by no means implies that they shall be necessarily represented by whole numbers. In order that they may be whole numbers, their relation must be such, that they may be all divided by the same number without a remainder. Prout contended at an early period, that the combining numbers were divisible in this way; in other words, that they might be divided by some number forming the common divisor of them all. The number which he selected for the common divisor was the combining number of hydrogen, which he fixed at one. Accordingly, he said that his common divisor, one, was contained in the combining number of hydrogen once, in the combining number of carbon, six times, in the combining number of oxygen, eight times, in the combining number of nitrogen, fourteen times, and so forth. Berzelius, to the last moment of his life, rejected the law of Prout, that the combining numbers are exactly divisible by a common

divisor; and, accordingly, in the cases of the elements just named, he represented their combining weights by the average numbers, deduced from his best analyses; even though the numbers obtained varied from a whole number by an amount so small as not to exceed the inevitable error of the best conducted analysis. At a comparatively recent period, Dumas undertook a research for the express purpose of determining whether the law of Prout was well-founded, at least so far as those elements are concerned which have a small combining weight; and the result of his examination has been, that, setting out with the hydrogen standard unit, carbon may be represented by 6, oxygen by 8, and nitrogen by 14, without any appreciable error. The proof of the accuracy of these numbers is so convincing, that, at the present day, the whole chemical world adopts them. The next important step in this investigation relates to the combining weight of chlorine. A number of skilful chemists have labored to determine its combining weight; as it is the hinge on which a great many analyses turn. It was found to be between 35 and 36, and for many years, 35·42 was adopted as a close approximation to the truth. These investigations, therefore, militated against Prout's law, as he enunciated it; for 35 and a fraction is not an exact multiple of 1. The investigation of the number for chlorine has been lately resumed by Dumas and other distinguished chemists, who have settled down in the belief that 35·5 is its correct combining weight. Prout's law, as laid down by him, constituted one case only under the general law, that all the combining numbers are divisible by the same number without a remainder. The case, adopted by Prout under the general law, was to make the divisor equal to the hydrogen combining weight, which, consequently, contained the divisor once. But the verity of the general law did not depend upon its being true in this particular case; but its truth depended upon this; namely, whether there could be found any number which would be contained in all the combining numbers, an exact number of times without a remainder. Let us see, then, whether the adoption of the number, 35·5 for chlorine, militates against the general law, as we have given it. To decide this question, let us select five-tenths as the common divisor. Thus, five-tenths are contained in 1, the hydrogen number, twice; in

6, the carbon number, twelve times; in 8, the oxygen number, sixteen times; in 14, the nitrogen number, twenty-eight times; and in 35·5, the chlorine number, seventy-one times. In this way it is shown, that the adoption of 35·5 as the number for chlorine, is not inconsistent with the general law of exact multiples; though it does not permit of the selection of unity, that is, the equivalent of hydrogen, for the common divisor.

If we suppose that the final result of the investigation, now in progress, shall be to prove that the common divisor of all the equivalents is a number, equal to half the equivalent of hydrogen, the question still remains to be answered, what hypothesis shall we adopt to explain this curious relation of the equivalent numbers? The most plausible one is that the common divisor represents the equivalent of an unknown element, which would, therefore, have an equivalent weight, half that of hydrogen. Dumas throws out this conjecture, and broaches the hypothesis that all the so-called elements may possibly be formed of one kind of matter; the unknown element being the parent matter, out of which all the other elements are formed, by its addition to itself, condensed to a greater or less degree. This hypothesis of the essential identity of all matter, appears to me to be extremely improbable.

It is now more than thirty years, since a German mineralogist called my attention to the fact, first observed, I believe, by the German chemists, that several cases existed, where three elements, having similar properties, formed a triad, and possessed equivalents, so peculiarly related, that, if the largest and smallest were added together, and divided by 2, the quotient would be the intermediate equivalent. This curious relation of the equivalents of allied elements was at first thought to be fortuitous, and likely to disappear when the numbers were more correctly determined. The progress of science, however, has not realized this surmise; but, on the contrary, rather gives support to the alleged relation. Dumas has recently taken up this subject, and has brought forward so many cases in support of the relation, that it may be considered almost as a law. Thus 16, added to 64, the equivalents of sulphur and tellurium, gives 80, the half of which, namely 40, is the equivalent of selenium. Again, 20 and 68, the equivalents of calcium and barium, added together,

make 88, and this number, divided by 2, gives 44, the equivalent of strontium. Once more, 7 and 39, the equivalents of lithium and potassium, added together, make 46, which number, when halved, gives 23, the equivalent of sodium. Chlorine, bromine and iodine are three elements, connected by the closest affinities. Here, according to Dumas, we have the equivalents, 35·5 for chlorine, 80 for bromine, and 127 for iodine. Let us see whether these numbers support the law. They certainly do not, very exactly; for, to confirm the law, the equivalent of bromine should be 81·25, instead of 80. Nevertheless, the departure from conformity to the law is not very great; and, when we reflect how nice a problem it is to obtain the equivalents of bromine and iodine exactly, from the difficulty of purifying these elements, we may be permitted to suppose, that new determinations may possibly alter the equivalents, 80 and 127, for bromine and iodine; although Dumas states that he obtained these numbers after the most careful experiments.

Before leaving this subject, I will mention a kindred one; namely, that two equivalents have, sometimes, the simple relation to one another of one to one, or of one to two. Thus, manganese and chromium have, according to Dumas, the same equivalent number (26), and we all know that the equivalent of sulphur is exactly double that of oxygen.

Perhaps I have occupied too much space with these curious speculations respecting the equivalent numbers. Hypotheses, however, are not without their use, and, if they lead us to interrogate nature by experiment, are often productive of fruit. Theories are more useful than hypotheses, because they embrace an extended generalization of facts, or supposed facts; still, they are liable to be changed with the progress of our knowledge. "A theory in chemistry," as Gregory has very happily expressed it, "is nothing more than such a view as groups together the largest number of facts at a given time; and has no pretensions to absolute truth, nor to be more than a guide to the inquirer, and an aid to his memory."

One of the most important sets of compounds, known to the chemist, is the series of homologous carbohydrogens, each containing a progressively increasing amount of carbon, represented, in equivalents, by the even numbers, 2, 4, 6, 8, &c., up to 60;

with but few chasms in the series, and these are filling up gradually by new discoveries. In these compounds the hydrogen uniformly exceeds the carbon, in number of equivalents, by one equivalent; and, consequently, is represented by equivalents, which gradually rise by the odd numbers, 3, 5, 7, 9, &c., up to 61. These carbohydrogens are *positive radicals*, each of which has a protoxide, that is, an ether; and also a hydrated protoxide, that is, an alcohol. Take from each of these positive radicals, two equivalents of hydrogen, which makes the hydrogen fall below the carbon, in number of equivalents, by one equivalent, and they are converted into *negative radicals*, each of which has a derived acid, all of similar constitution, being uniformly hydrated teroxides. Of the positive radicals, the first five in the series, namely, methyl, ethyl, propyl, butyl and amyl, are the most deserving of study; because they form a key to the knowledge of the principal ethers and alcohols.

In order to introduce to your notice the important doctrine of chemical substitution, which has been so fertile of new discoveries, I must remind you of the composition of the compounds of nitrogen and hydrogen. Ammonium is a compound radical, which consists of one equivalent of nitrogen and four of hydrogen. Withdraw the hydrogen gradually, one equivalent at a time, and you have, first ammonia, then amide, and, finally, imide; the latter being a compound of single equivalents of nitrogen and hydrogen. It is only lately that imide has been recognised under a distinct name. It is now many years since I pointed out in my lectures, that such a compound exists in hydrocyanic acid, associated with carbon, and mentioned how important it would be, for the elucidation of the laws of combination, to obtain it in a separate state; since it is composed of single equivalents of nitrogen and hydrogen. This compound, though now named, has not, indeed, been isolated, but may be transferred to different substances, so as to form various combinations.

Now, ammonia is a fertile source of substitution-compounds. It may have one, two, or all of its equivalents of hydrogen replaced by certain compound radicals, which fit, as it were, the place previously occupied by the hydrogen. We have, when one equivalent of hydrogen is replaced, amide bases; when two equivalents are replaced, imide bases; when three are replaced, that

is, all the hydrogen, nitryl bases. Of the ammonia there is left, in the first case, amide; in the second case, imide; in the third, nitrogen alone. Hence the names of these three classes of bases. The compounds which come in by substitution, are, principally, the five positive radicals, methyl, ethyl, propyl, butyl and amyl, already mentioned. The names of all the bases, thus formed, end with the syllables, "amine," as an abbreviation of the word, ammonia. Suppose one equivalent of methyl to be substituted for one equivalent of the hydrogen of ammonia; the amide base, thus formed, is called methylamine. In a similar way the names, ethylamine, propylamine, butylamine, amylamine, &c., are formed. The imide bases are more complicated; for here two equivalents of hydrogen undergo replacement, which may be done by two equivalents of the same radical, or by one equivalent of two different radicals. Finally, the nitryl bases are formed from ammonia by the replacement of all three of the equivalents of hydrogen; and here the replacing radicals may be all alike or all different, or two alike and the third different. From this sketch it must be evident, that these substitution-bases, derived from ammonia, are very numerous, and, at the same time, difficult to name.

Ammonium is considered by many chemists to be a compound metal. It was so considered by Berzelius; and hence he gave a metal termination to its name. Now, ammonium is the type of a set of bases, called ammonium-bases, which are even more interesting than the ammonia-bases. Thus, some of the nitryl bases are capable of uniting with one equivalent of a radical, additional to the three equivalents of radicals, already present by substitution. These four equivalents of radicals are, of course, united with one equivalent of nitrogen; and, hence, the compound is supposed to assimilate in constitution to ammonium, which is composed of four equivalents of hydrogen and one equivalent of nitrogen. For example, suppose triethylamine, which is a nitryl base containing three equivalents of ethyl, to unite with one additional equivalent of ethyl—not by substitution, for there is nothing for it to replace, but by what may be called annexation—and we get the ammonium-base, consisting of one equivalent of nitrogen and four equivalents of ethyl, called tetrethylammonium. Now, when it is considered that

the four eqs. of hydrogen in ammonium may undergo a quasi-displacement by four eqs. of radicals, all of them the same or all different, or partly the same and partly different, it is easy to understand that the ammonium-bases, if all discovered, would be very numerous. Already a large number of them have been obtained, chiefly through the labors of Hofmann. What is most singular in regard to these bases is, that, when converted into hydrated protoxides, they form compounds analogous to the hydrated protoxides of potassium and sodium, that is, to caustic potassa and soda; for, they have a caustic taste, saponify oils, and are capable of neutralizing acids. They have the bitterness of quinia, and it is not improbable that they may hereafter prove to be valuable remedies.

Organic chemistry, or the chemistry of the compounds, produced, for the most part, under the influence of the vital force, forms the most interesting, and, at the same time, difficult department of the science. The compounds known are very numerous, and but imperfectly understood; and the number of possible combinations is almost infinite. The great problem of modern chemistry to be solved, is to determine to what extent it may be possible to produce, artificially, the products of vital action. The production of the animal base, urea, by Wöhler, was the first example of an organic product, artificially formed, if we except oxalic and hydrocyanic acids. Two other bases of animal origin, namely, glycocin or sugar of gelatin, and kreatinin, have been artificially produced; and more recently, a number of vegetable organic bases have been formed by art. The discovery of these artificial bases is a step in the right direction, and well fitted to throw light on the nature of the natural bases, as to the manner in which these are built up under the influence of the vital force. The usual processes of the chemist have the effect of reducing more complex to less complex molecules; but, in order to succeed in producing the natural bases, his mode of proceeding must be reversed. He must build up more complex molecules from those that are less so, and thus imitate nature. This has been done in the formation of the bases, furfurine and amarine; and is there not room to hope, that the time will come when we shall be able to produce quinia and morphia artificially? Indeed, the attempt

has already been made by Hofmann to form quinia from quinoline, a principle found in coal-tar. Quinoline is a volatile oily base, which is likewise obtained from quinia and the other alkalies of Peruvian bark, as also from strychnia, when these substances are severally heated with caustic potassa. Here we have a case of transformation under the influence of potassa, which consists in reducing a complex molecule to a more simple one; but the converse reaction, which would imply the power of converting quinoline into quinia, &c., is quite a different thing, and much more difficult to accomplish. The recent researches of Wöhler, Blyth and Anderson have shown that narcotin, acted on by the deutoxide of manganese and sulphuric acid, is susceptible of numerous transformations, which throw a valuable light on the true constitution of the natural organic alkalies. Methylamine has been found among the products of the decomposition of morphia, codeia and caffein, and probably forms a constituent of these substances. By the action of nitric acid, brucia yields several products, among which is methyl, a fact which renders it probable that this radical pre-exists in it. These and similar facts lead to the conclusion, that chemists are on the eve of discovering a method of producing artificially some of the natural organic alkalies.

Should our hopes, in this respect, be disappointed, still it is highly probable that the artificial organic alkalies, the number of which is rapidly increasing by new discoveries, will furnish the physician with some valuable remedies. Already furfurine, in the form of nitrate, has been used as an antiperiodic. It is bitter, like quinia, and approaches, in composition, to several of the natural organic alkalies. For its discovery we are indebted to Fownes. Amarine, another artificial alkali, would probably prove an active remedy, and deserves a fair trial.

Within a recent period, the chemist has presented us with several principles, extracted from plants, which have proved to be more or less febrifuge. In proof of this it is only necessary to call attention to salicin, phloridzin, and picrolichenin, all of which, upon trial, have been found to be efficacious in arresting fever. At this time, particularly, this class of vegetable principles deserves to be studied in relation to their therapeutic applications; as a well-founded fear is entertained that the

cinchona trees of South America are in danger of being wholly exhausted.

When we consider the numerous contributions, made by chemistry to medicine, in the form of some of our most valuable remedies; and when we reflect that the future is as likely to be prolific in chemical discoveries as the past, we cannot fail to perceive, that to no science can the physician or pharmaceutist direct his attention with a greater prospect of enriching the healing art than to chemistry. The medical applications of the science are far from being all known. Chemical substances may yet be discovered, which shall rival, as therapeutic agents, ether and chloroform. The practical application of ether, as a means of abolishing pain, is exclusively an American discovery; and the subsequent use of chloroform for the same purpose, is only making a second, but far less important step in the same direction. Ether is a safe anæsthetic, and it is claimed that chloroform, *when properly used*, is safe also. Gregory has asserted, that, in Edinburgh, where chloroform has been employed in more, perhaps, than 100,000 cases, no instance of death has occurred from its use; and he attributed the fatal cases that have taken place elsewhere, either to the use of impure chloroform, to the unfitness of the cases in which it was employed, or, finally, to the administration of an over-dose. The question of the comparative merits of ether and chloroform as anæsthetics is a practical one, and must be decided in favor of ether; for, while safety requires that certain precautions shall be observed in giving chloroform, the neglect of these is attended with little or no danger in administering ether.

Chemistry has thrown an important light on certain dietetic articles, which are used by all civilized nations, and, after having been once adopted by them, have never been known to be laid aside. I allude to coffee and tea, and to the Paraguay tea and guarana of South America. The instinct of the human stomach, it would seem, leads different nations to adopt these substances as a drink; they being valued for their invigorating and refreshing qualities. The most enlightened nations employ, for the most part, coffee and tea; and, if our best writers were willing to own it, they would acknowledge their obligations, for much of their inspiration, to these beverages. Now, all these substances contain the same essential principle, namely, caf-

fein; although the substances themselves are derived from plants, belonging to four distinct botanical families. Chocolate furnishes another drink, employed like coffee and tea. This substance, it is true, is devoid of caffein; but it contains theobromin, a principle closely allied to caffein.

A few remarks will now be made on the beautiful chemical relations which subsist between plants and animals. The vital processes of vegetation are uniformly those of deoxidation, and the liberation of oxygen; while those occurring in animals are the reverse, or oxidation. The vital processes in plants consist in building up complex molecules, by means, for the most part, of deoxidation; the same processes in animals are characterized by the reduction of complex molecules to more simple ones, effected by oxidation. If plants alone existed, the oxygen of the atmosphere would be increased and its carbonic acid diminished, and plants would perish for want of carbon. If animals alone existed, the oxygen of the atmosphere would be diminished, and its carbonic acid increased, until at last it would become unfit to support animal life. By this wonderful compensation, effected by the vital action of plants and animals, the atmosphere is kept unchanged in composition; and, while plants give out oxygen, animals consume it, converting it into carbonic acid, which in turn furnishes part of the food of plants; they appropriating the carbon, and giving out the oxygen, to be returned once more to the atmosphere.

Organic chemistry is an extremely important study for the medical man. The chemical examination of plants throws much light on the vegetable materia medica, and is often rewarded by the discovery of the essential principles of our medicines, on which their activity depends. The analysis of animal parts and products, both healthy and diseased, furnishes information, highly important in the diagnosis and treatment of disease. What would have been the present state of pathology, let me ask, had the physician been deprived of analyses of the blood and urine? It will not be saying too much to assert, in view of the analytic precision attained at the present day, that the chemical study of the animal secretions will, for the future, form the surest means of advancing practical medicine.

The labors of physiological chemists have pretty well settled

the general principle, that the material by which our bodies are sustained, may be conveniently arranged under the heads of blood-producing food, and food which is principally consumed, during the process of respiration, in generating animal heat. The blood-producing food, consisting chiefly of albumen, fibrin and casein, contains nitrogen; while the heat-producing food is devoid of that element. Very complicated formulæ are assigned to the blood-producing principles, giving, according to some authorities, more than one hundred equivalents to two of their elements, namely, carbon and hydrogen. Such formulæ cannot be supported by analysis with any show of probability. Nevertheless, there are chemists, who take these improbable formulæ as proved; and venture to trace the transformations which the blood-producing principles of the food undergo, during their conversion into blood. Thus, they say, that casein, with a certain proportion of water, may yield blood-albumen and chondrin, the latter being the principle of cartilage; and, again, that two equivalents of albumen and two of water are equal to one equivalent of blood-fibrin, one equivalent of choleic acid, and one equivalent of gelatin. The equations here given are true equations, on the assumption that the composition of the substances concerned is correctly represented; but this assumption is wholly gratuitous. Admitting, however, that the analyses are correct, can it be believed that equations like these represent the truth of nature? These chemists, drawing on their fancy, do not hesitate to make any transformation that may suit their theoretic views. If they have too much oxygen to suit their views, oxygen is alleged to be given off; if there is present too much of both oxygen and hydrogen, then water is formed; and, if carbon is redundant, they do not hesitate to say that the portion in excess is removed, in the form of carbonic acid, by the oxygen of the air! This scientific facility reminds me of an ancedote which is related of one of our commissioners of patents, who was in office about the beginning of the present century. He was a man of general information, but had no pretensions to a knowledge of science; and to him, in his own opinion, every thing was easy to accomplish. Being simple-minded and credulous, he was easily imposed upon. A wag applied to him for a patent for making boards out of sawdust. Oh! my friend, said the commissioner,

that art has long been known, and is very easy. But, said the applicant, I fear, sir, you do not exactly understand my purpose. My invention consists in making *pine* boards out of *oak* sawdust. Oh! is that it, rejoined the commissioner; but that is very easy also, for you have only to add a little turpentine!

Our National Pharmacopœia was first published in 1820, under the authority of a Medical Convention, which met in Washington in that year. The credit of originating this work belongs to the late Dr. Lyman Spalding, of the State of New York. Agreeably to the recommendation of the first Convention, the work has been revised, by similar authority, at intervals of ten years; namely, in 1830, '40, and '50. It fell to my lot to assist in all these revisions; and it is natural that I should feel a deep interest in the approaching revision, which is to take place in 1860.* Before the appearance of our national standard in 1820, we were embarrassed by the conflicting authority of the three British Pharmacopœias, emanating severally from the Colleges of Physicians of London, Edinburgh and Dublin; and even since its appearance, we have still felt the disadvantage of the conflicting formulæ and nomenclature of these authoritative works. From an early period, British practitioners admitted the evil of having three Pharmacopœia standards; but how to remedy it was the great difficulty. If the British Colleges of Physicians could have agreed upon a common standard, the evil would have been removed; but their views were too conflicting, and all their attempts to construct a British Pharmacopœia proved fruitless. It is now more than twenty years since I received a letter from that distinguished chemist, the late Dr. Edward Turner, of London, in which he alluded to this subject, and gave it as his opinion, that no hopes can be entertained that the British Colleges will ever lay aside their local preferences, and agree upon one national standard; and that nothing but the strong arm of Parliament could effect that desirable object. In my Introductory of 1854, I made some remarks on the intimate connection between American and British Pharmacology; and,

* Dr. Bache is chairman of the committee, now engaged in the fourth revision of the U. S. Pharmacopœia, under the authority of the National Convention which met for that purpose, in May last, in Washington City.—Ed. Am. Jour. Ph.

after having spoken of the advantages which would flow from the adoption of a single Pharmacopœia for the British Empire, I endeavored to show that the only way to reach the evil was the one pointed out by Dr. Turner. Wishing to make known these views to the reading public, I had the part of my lecture relating to them published in this Journal, for January, 1855; and, subsequently, I was gratified to find that the extract was copied into the Pharmaceutical Journal, of London, for March of the same year. I have entered into these details, in order to convey to you the gratifying intelligence, that the British Parliament, after repeated failures for more than a quarter of a century, has at last passed a bill, the object of which, as stated in the preamble, "is to enable persons, requiring medical aid, to distinguish qualified from unqualified practitioners." The powers conferred by the bill are vested in a "General Council of Medical Education and Registration," consisting of eighteen members; twelve appointed by twelve medical corporations in England, Scotland, and Ireland, one by each, and six by the government. Among the powers conferred on the General Council, is that of publishing a single Pharmacopœia for the British Empire. The words of the act conferring this power are as follows: "The General Council shall cause to be published under their direction, a book containing a list of medicines and compounds, and the manner of preparing them, together with true weights and measures by which they are to be prepared, and containing such other matter and things, relating thereto, as the General Council shall think fit, to be called 'British Pharmacopœia'; and the General Council shall cause to be altered, amended, and republished such Pharmacopœia as often as they shall deem it necessary."

This is certainly an important step in medical progress, and one that intimately concerns all the apothecaries and medical practitioners throughout the world who speak and write the English language. Let us cherish the hope that the British work will be issued before the completion of the revision of our National Pharmacopœia, which is again to be published in 1860; so that we may avail ourselves of the labors of our British brethren.

IODIDE OF PROPYLAMINE.

By Benjamin J. Crew.

While the base Propylamine and its chloride are being investigated medicinally in this country, in order to verify or disprove the accounts received from Europe in relation to their asserted remedial powers in the cure of rheumatism, it occurred to the writer that a combination, of this new remedy with iodine, in the form of an *Iodide of Propylamine* might possess some valuable medicinal properties in the same disease in which iodine either simply or in some of its combinations has been long employed especially, in chronic cases attended with nodular swelling. Propylamine combines readily with the aid of a gentle heat with iodine, and forms a colorless solution, in which the characteristic odor of each of these substances can be perceived. It may be prepared by adding iodine to a convenient quantity of Propylamine in a glass flask over a sand bath as long as the iodine is taken up; a deep red solution is first formed, which as the combination is effected becomes gradually colorless; in case of an excess of iodine, a small addition of Propylamine will speedily take it up. Its odor, as before observed, is a combination; in taste it is saline, resembling closely iodide of potassium, and behaves with reagents like this salt, giving the usual characteristic precipitates with acetate of lead, nitrate of silver, &c. It is decomposed by acids, liberating free iodine, which colors the solution red; with concentrated oil of vitriol the violet vapors of iodine are evolved and crystallize on the sides of the test tube. It is alkaline to test paper, but upon exposure, it changes and gives an acid reaction. I have not been able to procure the crystals in any appreciable quantity, as upon concentration the Propylamine is volatilized, and the solution becomes red from free iodine.

Not having seen any account of this preparation, it may be proper to suggest a formula for its employment, should it be deemed worthy of examination and trial; and being in a liquid form, a formula similar to one published some time since in this Journal for the use of Propylamine is proposed.

℞. Iodide of Propylamine, 25 drops.
Peppermint Water, 6 f.oz.
Sugar, 2 dr.

Dose.—A tablespoonful every two hours.

In this form the patient would receive the $\frac{1}{16}$ gr. of Iodine at a dose.

Philadelphia, 7th month, 1860.

NOTE ON FLUID EXTRACT OF WILD CHERRY BARK.

By William Procter, Jr.

The recipe for this preparation, published at page 108, vol. 28th, (1856,) has been received with such general favor that it may be looked upon as an established formula, and probably is, in substance, the one to be adopted in the revised edition of the United States Pharmacopœia. In a paper on fluid extracts read before the American Pharmaceutical Association, last year, and published in the November (1859) number of this Journal, I included a process for this fluid extract of double the original strength, so as to be in the proportion of an ounce to the fluid ounce in accordance with the general strength adopted in that paper;—but at the same time it was doubted whether the bark could be properly extracted and condensed in so small a bulk without the loss of a portion of its valuable qualities. As the strength of eight ounces to the pint gives the dose a teaspoonful, the Committee of the College of Physicians of Philadelphia adopted the formula as originally proposed, in preference to the stronger preparation.

The object of this note is to offer a few hints in regard to the details of the process, which have been suggested by considerable practical experience with the manipulations required.

Wild cherry bark contains amygdalin, a bitter principle not yet isolated, tannic acid, resin and fixed oil, besides other less important matters. It is desirable to get all the amygdalin and the bitter principle and a part of the tannic acid in the fluid extract, whilst the remainder of the tannic acid and all of the resin and fixed oil should be excluded. In order to render these comments intelligible to the reader who may not have the volume for 1856 at hand, I will recapitulate an outline of the

formula, with the quantities altered for a gallon of the fluid extract.

Take of Wild Cherry Bark (Cerasus serotina) 64 ounces Troy.
Sweet almonds, 8 " "
Granulated Sugar, (pure), 96 " "
Alcohol (U. S. P.,)
Water, each a sufficient quantity.

Macerate the bark (powdered and passed through a No. 60 seive) moistened with two pints of alcohol, for two hours, pack it firmly in a cylindrical percolater, and gradually pour on alcohol until twelve pints have slowly passed. If the powder has not been carefully prepared as directed, the passage of the liquid must be regulated by a cork or stop cock. The tincture is then poured in a still, and ten pints of alcohol drawn over by distillation, the residue is evaporated to a syrupy consistence, and, while hot, mixed with two pints of cold water. Separate the resinous and oily matter which precipitates, and evaporate the liquid again till all traces of alcohol are removed. The almonds, without blanching, are now to be thoroughly beaten, with a little water, until reduced to a smooth paste. (This part of the operation is most effectually performed in an iron mortar with a flat-faced pestle.) They are then rubbed down with sufficient water to make the emulsion measure four pints, without straining it. This is then incorporated with the syrupy extract of the bark in a bottle, securely closed, and agitated from time to time for twenty-four hours, at least, and unless the weather is very warm forty-eight hours will be better, as on prolonged contact of the almonds with the amygdalin of the bark, depends the development of the hydrocyanic acid and volatile oil. The liquor is now thrown on a cloth, rapidly and forcibly expressed, to remove the solid residue, which is reserved, and the liquor filtered through paper into a gallon bottle containing sugar. If the liquid, thus obtained, is not sufficient to dissolve the sugar by agitation and make the measure of a gallon, pour water on the dregs in the cloth, express and filter until sufficient liquid is obtained to make that measure, and strain. The most annoying part of this process is frequently experienced in the extreme slowness with which the liquid passes the filter (owing to the fixed oil and fine particles of the almond paste,) and the conse-

quent tendency to loss of strength by the prolonged exposure. After many experiments, with gelatin, etc., and various filters, I have found the most satisfaction from the following plan: For the quantities mentioned take half a pound of prepared chalk, triturate it in a mortar with some of the turbid liquid, add it to the remainder, and shake the mixture well several times. It may now be poured at once on a muslin filter supported in a large funnel with ribs, when the liquid, which at first is cloudy, soon becomes transparent and passes with considerable facility. When the liquid ceases to pass, pour on water carefully to displace the portion retained in the chalky sediment. The chalk in no respect injures the preparation, having no reaction with any of the principles present that are medicinally important.

ANALYSIS OF MILK.

By Jno. M. Maisch.

It is conceded by all who live in our large cities, that a vast quantity of poor, diluted or adulterated milk is consumed therein. I have lately had occasion to examine a specimen, left with me by a milk dealer, to whom it was delivered by a farmer as pure and fresh country milk. The appearance of it already excited suspicion, it looked rather bluish and was decidedly "thin" when tasted. It was neutral to litmus and turmeric, and did not effervesce with acids.

Tested with the lactometer, it showed at 60° rather more than one-half water. To obtain certainty on this point, the caseine was collected from 2000 grs. of this milk; after washing with ether and drying it carefully, it weighed 86 grs., making 4·3 per ct. According to Knobloch, good summer milk contains between 8·40 and 8·67 per ct. together with the insoluble salts, (see Lehman's Physiol. Chemistry). The butter obtained from the ethereal solution weighed 20 grs. or one per cent; there was, however, a little butter floating on the surface which could not be mixed with the milk by agitation and had therefore to be neglected. Good milk contains between 3.13 and 5.10, an average of about 4.25 per. ct.

There is no doubt but this milk contained one half its measure of water; but from the small amount of butter, it may be possible that it was manufactured from fresh milk and skimmed milk each one part, and water two parts.

I have examined it for chalk and magnesia, but found it free from both.

Philadelphia, August, 1860.

ON THE IMPURITIES OF COMMERCIAL ZINC,

With special reference to the residue insoluble in diluted acids, to sulphur, and to arsenic.

By Charles W. Eliot and Frank H. Storer.

The above is the title of a valuable paper read before the American Academy of Arts and Sciences, May 29th, 1860, and published in vol. viii. new series, of its memoirs, of which it occupies forty pages quarto. The importance of pure zinc in chemical, and especially in medico-legal researches, has been a prompting motive with the authors in their work.

In order to make the results as general as possible, the authors obtained authentic specimens of zinc from the following sources, viz:

1. Silesian zinc.
2. Vieille Montagne (Belgium) zinc.
3. New Jersey (American) zinc.
4. Pennsylvania zinc, (Pennsylvania and Lehigh zinc works, Bethlehem, Pa.)
5. Vieille Montagne zinc, such as is used in the U. S. Mint.
6. A zinc labelled "Zinc pur," Rousseau Frères, Paris.
7. A sheet zinc of unknown origin obtained at Berlin (Prussia.)
8. An English zinc, made near Wrexham, North Wales.
9. An English zinc from the Mines Royal, Neath, Glamorganshire.
10. An English zinc from the works of Dillwyn & Co., Swansea.
11. An English zinc from the works of Messrs. Vivian, Swansea.

A qualitative examination of the residue left by these zincs, when treated with dilute acids, showed that they consisted chiefly of *metallic lead.* In fact the authors have arrived at the conclusion, that lead is the chief impurity in commercial zinc, and that carbon, tin, copper, iron, arsenic and other impurities found in it by previous observers, occur either in very minute quantities, or rarely and doubtless accidentally.

Lead.—The authors found the following percentages of metallic lead, estimated as sulphate, using diluted SO_3 saturated with sulphate of lead, as the solvent of the zinc, and treating the insoluble residue with diluted NO_5 and washing it well.

Names of Zinc.	Wt. of Zinc taken.	Wt. of Lead obtained.	Percent. of lead.
1. Silesian,	23.8066 grammes.	0.3472	1.460
2. Vieille Montagne,	25.2795 "	0.0738	0.292
3. New Jersey,	28.672 "	0.0225	0.079
4. Pennsylvania,*	26.522 "	0.0000	0.000
5. U. S. Mint,	24.5308 "	0.1212	0.449
6. Rousseau Frères,	24.3432 "	0.0259	0.106
7. Berlin,	23.074 "	0.2990	1.297
8. Wrexham,	29.999 "	0.3569	1.192
9. Mines Royal,	38.8276 "	0.3197	0.823
10. Dillwyn & Co.,	31.6425 "	0.5256	1.661
11. Messrs. Vivian,	27.724 "	0.4203	1.516

The authors carefully verified their processes for estimating the lead by determining the SO_3 in each specimen of sulphate; and also answered the question, whether the use of diluted SO_3 saturated with sulphate of lead would introduce lead into the result, satisfactorily in the negative.

Cadmium and Tin.—The filtrates from the precipitates of sulphate of lead of the several zincs enumerated above, except that from Pennsylvania, were saturated with sulphuretted hydrogen for twenty-four hours or upwards, and the small precipitates which separated were filtered off, washed quickly with sulphuretted hydrogen water, dried and ignited; they were then treated with a few drops of nitric acid, again evaporated to dryness, ignited and weighed. The color of these precipitates was yellowish brown, except that from New Jersey zinc, which was blackish, owing to the copper it contained as afterwards ascertained. The authors determined the absence of arsenic and antimony, and the precipitates were therefore the oxides of tin or cadmium, or both. The amounts of these precipitates from the same weights of zinc, as in the table above, and in the same order,

* This Zinc gave no residue.

omitting the Pennsylvania zinc, are as follows: The numbers giving the amount of the precipitates per cent. of the zinc treated.

No. 1.	0.0564	No. 7.	0.0178
No. 2.	0.0281	No. 8.	0.0070
No. 3.	0.4471	No. 9.	0.0041
No. 5.	0.0098	No. 10.	0.0035
No. 6.	0.0406	No. 11.	0.0285

Of these samples, numbers 1, 5, 6, 8, 9 and 10, contained none or but faint traces of tin, whilst the others gave distinct spangles of tin by the blow-pipe test.

Copper.—None of the specimens, but that from New Jersey, gave the slightest evidence of the presence of copper, and that was found to contain 0.1298 per cent. of that metal.

Iron.—The authors examined three of the samples for this metal, but did not feel it needful to push them further, as published experiments already show that its proportion rarely exceeds two-tenths of one per cent. They found 0.2088 per cent. in the New Jersey zinc; 0.0586 in the mint zinc; and 0.674 in the Berlin (sheet) zinc.

Carbon.—The authors after some carefully conducted experiments, have arrived at the conclusion that carbon is much more rarely a constituent of commercial zinc than has been frequently believed, as their very accurate experiments gave hardly a trace of evidence in favor of its presence.

Sulphur.—The authors found sulphur present in each of the specimens enumerated by adding ten or fifteen grammes of each zinc to a mixture of chloride of calcium and pure muriatic contained in a small flask, the neck of which contained paper moistened with alkaline acetate of lead. Every precaution was taken to avoid sulphur in the agents used, as described at length, in the authors' memoir.

Arsenic.—The authors have very thoroughly investigated the subject of arsenic as an ingredient of commercial zinc, and to assure themselves of the accuracy of their experiments have investigated the American acids with a view to the same impurity. The authors believe that the general opinion that arsenic is a very common impurity in commercial zinc may be traced to Proust, who, with others, long before the discovery of cadmium

in 1817, most probably confounded the sulphides of these metals, the latter of which being a common admixture. The delicate indications of Marsh's apparatus, which so easily detects arsenic in zinc, when present, added to this belief before attention was turned to the contamination of acids by the same metal, and there is reason to believe, at times, that this has been the source of the metal when it has been attributed to the zinc.

"The conclusions at which we have arrived, after a long course of experiments with many different zincs, and various acids, are these:—first, that much of the zinc of commerce is free from arsenic, or at least contains no arsenic that can be detected by the most delicate tests for that metal; secondly, that the sulphuric and chlorohydric acids found in commerce do very often contain arsenic, and are always so liable to contain it as to be utterly unfit for use in Marsh's process without special purification for that purpose. The steps by which we are led to these results, and the evidence on which they are founded, we proceed to describe. We have used exclusively Marsh's process for the detection of arsenic, applied with the apparatus and with all the precautions recommended by Otto.* Our apparatus consisted of a flask provided with a funnel tube, and a tube bent at right angles, with which were connected by connectors of sheet india rubber, first, a tube of the form of a chloride of calcium tube, filled with asbestos; secondly, a similar tube filled with pumice stone soaked in caustic potassa; and thirdly, one filled with chloride of calcium. Through these three tubes, in the order in which they are named, the gas generated in the flask was obliged to pass before it arrived at the reduction tube, which was of hard German glass, and about one centimetre in diameter. The reduction tube was drawn down to a fine bore, and during the progress of an experiment was heated by one of Bunsen's triple gas-burners. To prevent any elevation of the temperature in the flask during an experiment, it was immersed in cold water, and the dilute acid used was always cold and added in small quantities. With this apparatus, (which for convenience we shall designate as Otto's apparatus), taking every possible precaution to insure its perfect cleanness, we made several experiments upon Silesian zinc. Two hundred grammes of this spelter, carefully granulated, were used in each experiment, and the sulphuric acid employed was a commercial acid made in this country from Sicily sulphur. We were not unaware of the fact that arsenic is almost invariably found in the foreign sulphuric acid made from various impure sulphurs of unknown origin, or from pyrites; but it is a common impression that the American acid manufactured directly from Sicily sulphur is free from arsenic. Positive statements to this effect have been made by chemists who have had mainly in view the common use of sulphuric acid in the preparation of chemical compounds used in Pharmacy, and the assertion has enough

* Manuel of the Detection of Poisons. New York, Bailliere, 1857.

plausibility to command ready and general belief. Using such acid and two hundred grammes of Silesian zinc, we obtained at the end of an hour, during which the reduction tube was heated, a deposit of arsenic perfectly distinct, though not bright enough to be called a mirror. Our next experiment was made with the same acid upon two hundred grammes of a sample of Vieille Montagne zinc, perfectly clean and carefully granulated. At the end of the hour during which the gas was passed through the reduction tube, a brownish, volatile coating was found in that part of the tube where the bore was smallest. These experiments on Silesian and Vieille Montagne zinc were several times repeated and always with the same result; the deposit in the reduction tube was often too thin and slight to be positively identified as arsenic; but it could not be distinguished from the deposit of that metal and would have been perfectly fatal in a medico-legal investigation, or in any case in which absolute purity of the materials was desired. Not convinced that the zincs were the source of the arsenic, we desired to prepare a quantity of sulphuric acid in which the presence of arsenic could not possibly be suspected. To attain this object we subjected a specimen of American sulphuric acid to the following process: The acid was first boiled with a little flowers of sulphur, as proposed by Barreul, in order to free it from the nitrous fumes which the common sulphuric acid almost always contains; a small quantity of pure chlorohydric acid was then stirred into the cooled acid, which had been carefully decanted from the free sulphur, and the whole again boiled; to the acid again cooled, a second addition of chlorohydric acid was made, and again the acid was heated till dense white fumes had been escaping for upwards of half an hour. During this process the volatile chloride of arsenic is completely driven off, the second addition of chlorohydric acid being made, as has been recommended by H. Rose, in order to insure this result. Lastly, a portion of chlorine-water was added to the cooled acid to oxidize any sulphurous acid which might be contained in it; and after a third boiling, the acid, cooled and diluted with three parts of water, was ready for use. This method of purifying sulphuric acid is a combination and modification of several well known processes." "With the acid thus prepared, we tested two hundred grammes of Vieille Montagne zinc, and after passing, during more than an hour, a continuous gentle stream of gas through a reduction tube, of which about four centimetres were maintained at a bright red heat, we found that there was absolutely no deposit whatever in the cool and narrow part of the reduction tube. With the same acid and apparatus, two hundred grammes of Pennsylvania zinc (which has proved to be altogether the purest zinc in our possession) gave absolutely no deposit of any kind in the fine reduction tube at the end of one hour, the time during which, in all our examinations for arsenic, we maintained a steady flow of hydrogen through the red hot reduction tube." "In order to satisfactorily establish these conclusions it was necessary to prove by frequent repetition, that the same result might always be expect-

ed from these two zincs, and that their freedom from arsenic was a property shared by the whole sample, and not an accidental peculiarity of a particular fragment. At sundry times we therefore repeated again and again the long and careful test for arsenic above described with these two samples of spelter, and invariably arrived at the same conclusion; namely, that no deposit of any kind could be obtained in the reduction tube from these zincs and purified sulphuric acid."

The authors, by adding infinitessimal quantities of arsenious acid to these zinc and acid mixtures, say that they could easily detect a proportion of arsenic less than the ten millionth part of the zinc used.

The authors subsequently applied the test to the other zincs of the list, and all of them, including the New Jersey zinc, were found to contain various minute quantities of arsenic. The authors finally remarked that the purest of all the zincs they have analyzed, is that manufactured at the Pennsylvania and Lehigh zinc works, Bethlehem, Pa. This spelter dissolves in dilute sulphuric acid without leaving any appreciable residue, and therefore contains no lead; indeed, a trace of cadmium is the only impurity, whose presence in the zinc we could confidently assert. The ore from which this spelter is made is the hydrated silicate of zinc (electric calamine) and it is not surprising that this mineral should yield zinc of singular purity, if the ore be carefully selected. We have stated above, that our first sample of this zinc was free from arsenic, but a second sample was not pure in this respect. At these works the oxide of zinc is manufactured as well as the metal, and we learn from a letter addressed to Prof. Brush, by Mr. Wharton, the director of the works, that the crust from the oxide furnaces has now and then been worked into spelter, and that the ore used in making the oxide is less carefully selected than that which goes to the spelter furnaces, and is much more likely than the latter to contain both blende and pyrites. This fact may account for the occurrence of arsenic in some specimens of this spelter while the greater, part of it, manufactured from carefully selected silicate of zinc, is perfectly free from that impurity. There seems to be no reason why zinc of uniform purity should not be obtained from this excellent ore.

TARTRO-CITRIC LEMONADE.

(*Liquor Sodæ Tartras.*)

By Prof. J. Lawrence Smith.

There is nothing new in the use of tartrate of soda as a purgative, and it is only surprising, that once known, it ever gave place to the citrate of magnesia, to which there are several objections well known to practitioners. Among these I would enumerate the not unfrequent irregularity of its operation, sometimes not acting as promptly as desired, at other times with too great and continued energy, requiring anodynes to arrest its operation. Again, owing to the manner in which it is made, and the want of uniformity in the composition of the commercial carbonate and calcined magnesia, the amount of free acid in the solution varies much, when made at different times by different operators, and with different lots of materials. There being sometimes two or three drachms of free acid present in a bottle, and besides, under all circumstances, the mixture must be quite acid in order to retain for any length of time the citrate of magnesia in solution. Mitscherlich and Bence Jones have both made experiments on citric acid, and they consider it a poison analogous to oxalic acid.

Yet another objection to citrate of magnesia is the certainty of its undergoing decomposition, resulting in the deposition of an insoluble citrate of magnesia, a change that takes place very rapidly when the bottle is opened.

With these facts before me, I compounded a preparation of tartrate of soda with lemon syrup and water, (at first I introduced a small portion of citric acid, calling the mixture Tartro-Citric Lemonade.)

It is free from the objections of the citrate of magnesia, is a prompt and certain purgative, without excessive action, and uniform in composition, does not undergo decomposition even after the bottle is opened, even more agreeable to the taste and less costly than citrate of magnesia. It was first manufactured by T. E. Jenkins & Co., and is now also manufactured to a large extent at the Louisville Chemical Works.

The formula adopted by Messrs. T. E. Jenkins & Co., at the Louisville Chemical Works, which is under my direction, is

Sal Soda,		21 lbs. 14 oz.	avoirdupois.
Tartaric acid,		15 lbs.	"
Sugar, (white)		24 lbs.	"
Water	to make	25 gals.	"

It is then put into strong twelve ounce bottles, and thirty-five grains of bicarbonate of soda added to each bottle, and immediately corked and fastened by twine or wire.

This preparation has been used in Louisville for about six years, and is gradually extending over various parts of the West and South. Wherever it has once got into use, it has never been abandoned, and the names of hundreds of physicians could be obtained, certifying to its utility and preference over the citrate of magnesia. I think that it would be well for our Pharmacopœia to adopt it.

CALIFORNIA BEER, OR YEAST PLANT.

By the Editor.

A correspondent in North Carolina has forwarded to us a small vial of a yellowish opaque fluid, which he states is the so-called "California beer" plant. Since then we have received a small package of a translucent gum-like matter, labelled "California Beer Plant," from Wm. H. Bassett, of California. The Southern Medical Journals have had several communications in them referring to certain deleterious results, and even death, from the use of this "beer" in bread making, which appear to be unfounded. Dr. W. H. Bowling, the Editor of the Nashville Journal of Medicine and Surgery, (see that Journal, May, 1860,) thinks that it is identical with *Torula cerevisiæ*, the common yeast plant, or if not identical, closely allied to it. He says, "Let us put now this California yeast under the microscope, and we will find the same thing—a number of oval cells, containing granules, and multiplied by budding in a manner similar to that of yeast, and like it, only somewhat smaller, as far as we have seen. The plant has probably the same origin as the yeast plant, but what that is is a mystery," &c. Dr. Leidy, to whom a portion of this specimen was submitted, finds it to be the same plant as in ordinary yeast. We confess to being quite ignorant of the history of the so-called "California beer" plant,

as none of our correspondents have referred to its origin. The Pacific Medical Journal for May repudiates the idea of its possessing any deleterious properties. Cannot some of our friends give the history of this substance?

HYPOPHOSPHITE OF QUINIA.

By J. Lawrence Smith, M. D.

Professor of Chemistry, University of Louisville.

I brought this article to public notice a short time ago, through the pages of this Journal. As I was not then prepared to give a statement of its composition, that omission will now be made up.

In 100 parts there is

Quinine, ...	83.00
Hypophosphorous acid, . . .	10.09
Water of combination, . . .	2.30
Water of crystallization, . . .	4.60

Giving the formula: $C^{40}H^{24}N^2O^4,PO,HO+2$ aq.; or, according to Gerhardt's method of statement, just double that formula. Its physical characters have been fully described.

The manner in which it is manufactured at the Louisville Chemical Works is as follows:—50 ounces of sulphate of quinine is placed in a large porcelain capsule; to this is added 2 gallons of distilled water, and 2 ounces of hypophosphorous acid. Warm up to about 200° F., and make a perfect magma of the sulphate of quinine and water, then add a solution of hypophosphite of baryta until a perfect decomposition is produced. Great care must be taken to have no excess of baryta salt; better have a slight excess of sulphate of quinine. But a little skill will enable a competent operator to obtain an exact neutralization. While warm, the solution of hypophosphite of quinine is filtered off from the sulphate of baryta and allowed to crystallize. The sulphate of baryta is then washed, and the washings added to the mother water of the first crystallization, and evaporated with great care, when other crystals may be obtained. If not carefully evaporated, it will become colored. The crystals are drained and dried on a cloth stretcher.

Louisville, (Ky.,) Aug. 20th, 1860.

LETTER TO THE EDITOR ON THE BOTANICAL SOURCE OF BALSAM OF PERU.

By Daniel Hanbury, F. L. S.

London, August 2d, 1860.
Plough Court, Lombard Street.

My dear Sir,—I am extremely obliged to you for sending me that portion of the last number of the *American Journal of Pharmacy* which contains the two communications on the Balsam of Peru. The subject is one which I have long studied, and in which I have taken much interest, especially since the death of my old preceptor, Dr. Pereira.

Dr. Carson's paper is valuable from containing a figure (the first that has been published) of the flowers of the Balsam of Peru tree;—but on the other hand I am concerned to think the author has not had access to some direct information on the subject. Since Pereira's paper was published, we have learnt much from other sources respecting the botany of *Myrospermum* and *Myroxylon*. The *Myrospermum* of Sonsonaté, (Pereira in *Pharm. Journal*, Dec. 1850,) has been admitted a distinct species, and described as such by Royle, under the name of *M. Pereira* (Royle, *Manual of Mat. Med.*, ed. 2, 1853, p. 414.)

In addition to this, Dr. Klotzsch, of Berlin, has published in the *Bonplandia*, 15th Sept., 1857, an elaborate enumeration of all the species of *Myroxylon* and *Myrospermum*—the former 8 in number, the latter 3. Royle's species is transferred to the genus *Myroxylon*, under the name of *M. Pereira*, Kl., and maintained by Dr. Klotzsch as quite distinct from *M. peruiferum*, Mutis et Linn. fil. As my own herbarium includes small specimens of all the species enumerated by Dr. Klotzsch, and I have carefully examined the specimens that are contained in the herbaria of Kew, the British Museum, and the Jardin des Plantes in Paris, I may be allowed to offer an opinion in confirmation of Dr. K's. view, that these species are distinct. At the same time I must express the opinion that several of Dr. Klotzsch's species are founded on very inadequate materials, and that much remains to be done before we arrive at a satisfactory knowledge of the plants in question.

I hope Dr. Carson will continue in communication with Dr.

Dorat, and induce him to obtain still further information respecting the manufacture of the so-called *Balsam of Peru*, as well as additional specimens of the tree. With this view, I am writing him a few lines by this mail.

Believe me to remain, my dear sir,

Yours, very sincerely,

DANL. HANBURY.

ON RED PRECIPITATE OINTMENT.

BY F. A. KEFFER.

To the Editor of the American Journal of Pharmacy:

SIR,—Being aware of the great difficulty in keeping, especially in warm weather, the Ung. Hydrargyri Oxidi Rubri, I have been lead to make some experiments with the same, and find that, instead of using lard, if I use Oleum Ricini, that the preparation will keep perfectly well for a great length of time. I have now in my possession a sample that has been made over two years, and it is perfectly free from rancidity, and still retains its original color, the mercury to all appearance not having become deoxidized in the least. My formula is

℞. Olei Ricini,	. . .	℥iiiss.
Ceræ Albæ,	. . .	℥ss.
Hydr. Oxidi Rubri,	. .	℥ss.

Melt the wax and oil with a gentle heat, and when cool rub in the red precipitate previously reduced to fine powder.

Hoping the publication of this will be of some advantage to Pharmaceutists, I remain yours, &c.,

FRED. A. KEFFER.

Philada., July, 1860.

THE POISON-OAK AND ITS ANTIDOTE.

BY COLBERT A. CANFIELD, M. D.

In the woods and thickets of California, as well as on the dry hill-sides, and in fact in every variety of locality, may be found a very venomous shrub,—the "poison-oak" or "poison-

ivy;" the *hiedra* of the Spanish people—the dread of all those who are acquainted with it.

This plant is known scientifically as follows:—it belongs to the natural order *Anacardiaceæ* and is called *Rhus diversiloba* by Torrey and Gray, *Rhus lobata* by Hooker, and *Rhus toxicodendron* by Hooker and Arnott. It is very similar to the poison-ivy of the Atlantic States, (*R. toxicodendron*, Linnæus), both in its appearance and in its poisonous qualities. But it is unnecessary for me to describe it, even popularly; for it is unhappily too familiar to all; and I will only remark that, although generally a small shrub, the trunk sometimes attains the diameter of six inches, and the whole plant climbs over some large tree for support. The finest specimens that I have ever seen were in an oak and laurel grove on the road south of San Jose.

I do not need to describe the cutaneous disease that is produced by contact with or approach to the poison-oak. And it is hardly necessary to advert to the fact that this poison is the cause of a vast deal of misery and suffering in California; and that there is scarcely ever a time in any little town or neighborhood when there are not one or more persons suffering from it; and I venture the assertion that there are in this State constantly from five hundred to a thousand persons afflicted with this disease.

Farmers and laborers are especially liable to this poisoning; and besides the suffering and annoyance caused by it, the loss of valuable time is no small item to be taken into the account. Truly he who makes known a prompt and sure antidote to this poison will be a public benefactor; and this communication is made to the public with the confident expectation that the remedy here described will prove to be such benefaction.

The remedies in use for the effects of the poison-oak are quite various, and some of them will cure the milder cases. Of all the common remedies, the warm solution of the sugar of lead has within my experience been productive of the best results. The water of ammonia, warm vinegar and water, the warm decoction of the leaves of *Rhamnus oleiflious* ("Yerba del Oso," of the Californian Spanish,) or even pure warm water, are sufficient sometimes to produce a cure. All these remedies are, of course applied externally by way of washes to the parts affected.

But the only remedy that I have found *invariably* successful as an antidote for this poison is an indigenous plant growing very abundantly in this vicinity and in other parts of the State. It is a tall, stout perennial; belongs to the Composite family, and looks like a small sun-flower. It is from one to three feet high; has bright yellow flowers in heads one to two inches in diameter, (and as I have said) like small sunflowers, flowering from June to October. Before flowering, the unexpanded heads or buds secrete a quantity of resinous matter, white and sticky—like balsam, that is finally, after the flower expands, distributed over the petals, &c., of the flower like varnish. The whole plant, flowers, leaves and all, is resinous and viscid. When it grows in dry hills, it is stiff and rigid, with narrow, thin leaves; but in damp localities it is more robust and succulent, with wide, fleshy leaves.* Its botanical name is *Grindelia hirsutula and G. robusta;* but I have not been able to find more than one species, and all the different forms possess the same remedial virtues.

The mode of using it is as follows: one may bruise the fresh herb and apply it by rubbing over the parts affected; or boiling it in a covered vessel, make a strong decoction of the fresh or dried herb, with which to wash the poisoned surfaces. Its remedial properties appear to be contained chiefly in the resin or balsam-like juice of the plant, which is particularly abundant on the surface. One application is sometimes sufficient for a cure; but if the disease has been of long duration, several days will elapse before relief is obtained.

The plant is a remedy for the poison-oak used originally by the Indians of this vicinity, and by them its virtues have been communicated to the Spanish Californian people who are now commencing to use it.

I became acquainted with it in the following manner: A lady acquaintance of mine was poisoned in early youth by the poison-oak, and there resulted a cutaneous affection similar to "salt-rheum,"—fiery, burning, insupportable—that would not yield to remedies or the skill of good physicians. She under-

* The MS. sent to the printer is as follows; "Its botanical name is *Grindelia hirsutula*, of Hook and Arnott; and it belongs to the natural order *Compositæ;* of the two for msmentioned above, the botanists have made two species, *Grindelia hirsutula* and *S. robusta:* but I have not," &c.

went cauterization and blistering; she took mercury and other powerful remedies, iodine, sarsaparilla—all to no purpose. Her hands were covered with deep ulcers, and her wrists and arms with an eruption that tormented her day and night. Nothing relieved her. She married in the mean-time, and had a family of fine, healthy children, but she did not get rid of her affliction. At length, she believing that the disease was not "salt-rheum" nor anything more or less than the effects of poison-oak, was induced to use the remedy that I have described; and a very few applications were sufficient to heal up the ulcers and cure her entirely. She has never been troubled with any cutaneous eruption since that time, although several years have now elapsed.

Her account of her case induced me to use the plant, which I have done frequently since with the happiest effects. One gentleman of my acquaintance, who is very susceptible to the poison-oak, was poisoned on the face, hands, etc., and the disease did not yield to sugar of lead, hartshorn, warm lotions or any other of the commonly used remedies. But a few applications of the docoction of Grindelia removed it entirely. It is said that when Fremont was here with his soldiers they camped on the flat below the town among the poison-oak, and many of his men were badly poisoned. The trouble in many cases did not yield to the prescriptions of the physicians, and it was relieved only by using this remedy. But aside from rumor or hearsay I am cognizant of six cases in which the effects of poison-oak have yielded to the Grindelia when other remedies have failed. Now it cannot be said that the effects of the Grindelia, as stated above, were imaginary, or those cures accidental: for the disease produced by the poison-oak is specific and *sui generis*, a cutaneous disease palpable and severe, that is produced by a specific vegetable poison, and hence does not at all (as may be said of many other diseases,) depend upon the imagination or moral state of the patient either for its cause or cure.

It may not be amiss to say in conclusion, that the Grindelia is used also by the people of this country as a remedy for other cutaneous diseases that are characterised by heat and itching; such as nettle-rash, salt-rheum, etc., but I have no means of knowing its effects in these diseases.

Monterey, Oct. 10, 1859. *Pacific Sentinel.*

EXPLOSIVE PROPERTIES OF OXALATE OF PEROXIDE OF MERCURY.

By Peter Hart.

Having two days ago prepared a small quantity of oxalate of mercury, I allowed it to remain on the sand-bath drying until this morning, when it exploded with great violence, breaking the basin and dispersing the fragments so effectually, that not more than three or four pieces have been found, and these do not exceed in size half a finger nail.

I was absent at the time of the occurrence, but have had the relation of the circumstance from my father, who, in fact was reaching out his hand to remove the basin at the moment the explosion occurred, having perceived signs of decomposition going forward, puffs of gas coupled with sharp crackings having for some seconds issued from it. Several of the fragments struck him in the face, but fortunately did him no serious injury.

When I arrived I found some half-dozen panes of glass situated about twenty feet distant from the basin, broken by flying fragments, one piece of apparatus was broken, evidently by the concussion, and the whole of the tables, even at the farthest point of the laboratory, were covered with sand projected from the bath.

I send you this account because it appears to me that this salt (oxalate of the *peroxide* of mercury) appears to be more explosive than the books would lead us to imagine. Gmelin says that it decomposes with a hissing noise. According to this author the mercurous oxalate appears to be more explosive than the mercuric; for speaking of the former salt, he says: "When suddenly heated in a glass tube it detonates." It is possible that a portion of the salt I prepared (which was not more in quantity than from 1 to 2 ounces) might have been reduced to mercurous oxalate, but whether that was the case or not, it certainly decomposed with more than a hissing noise.—*Druggists' Circular.*

ON THE DIETETIC AND MEDICINAL PROPERTIES OF ERYTHROXYLON COCA.

By Dr. Mantegazza.

(Prize Essay. Pamphlet. Milan, 1859.)

The Erythroxylon Coca, a plant which grows in moist and woody regions on the eastern slopes of the Andes, is highly valued by the inhabitants of Peru, Chili, and Bolivia, not only as a medicine, but also as an article of food; and serves with them as a substitute for the tea, coffee, betel, tobacco, haschisch, and opium used by other nations. Its culture, upon which, since the time of Pizarro's conquest, much care has been bestowed, has recently increased to such a degree, that in the year 1856 the revenue of the Republic of Bolivia, from the sale of this herb, amounted to thirteen millions of francs—a very large sum, if compared with the small number of consumers (800,000.) According to the account of M. Pöppig and of other well-known travellers, the natives use the dried leaves of the coca-plant either by themselves or in combination with a highly-alkaline substance called *llipta*, which is prepared from roasted potatoes and the ashes of different other plants; they masticate them like the Malays and the inhabitants of the Indian Archipelago do the calcined leaves of the clavica betle. The use of this masticatory, which is considered a great delicacy, is not, however, confined to the rich; on the contrary, it is particularly among the hard-working Indians that the coca enjoys a high reputation as a nutriment and restorative, and its use is considered absolutely essential for the endurance of fatigue and exertion, so that a laborer in making his contract has a view not only to wages, but to the amount of coca to be furnished. The Inca who lives at a height of seven to fifteen thousand feet above the level of the sea, and whose meagre fare consists principally of maize, some dried meat, and potatoes of bad quality, believes that he can sustain his strength solely by the use of coca; the porter who carries the mail, and accompanies the traveller over the roughest roads at the quick pace of the mule, invigorates and strengthens himself by chewing coca; the Indian who works half naked in the silver and quicksilver mines, looks

upon this plant as an ambrosia capable of imparting new life, and of stimulating to new exertions. It is not surprising, under such circumstances, that this article should be very much abused, and that the evil of intemperance in the use of coca, known as coquear, should be quite as prevailing among the natives of those districts, as intemperance in the use of tobacco, alcoholic liquors, and opium is among other nations. They often intoxicate themselves for several weeks, hide in the deepest forests in order not to be disturbed in their enjoyment, and not rarely return home to their family suffering from delirium or decided idiocy.

The child and the feeble old man seize with equal eagerness the leaves of the wonderful herb, and find in it indemnification for all suffering and misery. Be it that the praised efficacy of the plant is merely the effect of fancy or tradition, or that the plant really contains a powerful principle unknown to science, the solution of this mystery is certainly a worthy theme for scientific inquiry, and the investigations of Dr. Mantegazza deserve, therefore, our full attention.

Dr. Mantegazza observed that the chewing of a drachm of the leaves of the coca increased salivation, giving at first a somewhat bitter, and afterwards an aromatic taste in the mouth, and a feeling of comfort in the stomach, as after a frugal meal eaten with a good appetite. After a second and third dose, a slight burning sensation in the mouth and pharynx, and an increase of thirst, were noticed; digestion seemed to be more rapidly performed, and the fæces lost their stercoraceous smell, the peculiar odor of the juice of the coca becoming perceptible in them. On using the coca for several days, the author observed on himself as well as on other individuals a circumscribed erythema, an eruption around the eyelids resembling pityriasis; from time to time a not unpleasont pricking and itching of the skin was felt. An infusion of the leaves, taken internally, was found to increase the frequency of the pulse in a considerable degree. In making observations on the frequency of the pulse, the author was very careful to consider all the conditions which might influence it; he found that the temperature of the air being the same, and the liquids being heated to an equal degree, an infusion of coca will increase the action of the heart four

times its normal standard, while cocoa, tea, coffee and warm water only double it. By taking an infusion prepared from three drachms of the leaves, a feverish condition was produced, with increased heat of the skin, palpitation of the heart, seeing of flashes, headache, and vertigo; the pulse rose from seventy to one hundred and thirty-four. A peculiar roaring noise in the ear, a desire to run about at large, and an apparent enlargement of the intellectual horizon indicated that the specific influence upon the brain had commenced. A peculiar, hardly describable feeling of increased strength, agility, and impulse to exertion follows; it is the first symptom of the intoxication, which is, however, quite different from the exaltation produced by alcoholics. While the latter manifests itself by increased but irregular action of the muscles, the individual intoxicated by coca feels but a gradually augmented vigor, and a desire to spend this newly acquired strength in active labor. After some time the intellectual sphere participates in this general exaltation, while the sensibility seems to be hardly influenced; the effect is thus quite different from that produced by coffee, and resembles in some degree that of opium. Dr. Mantegazza could, in this excited condition, write with ease and regularity. After he had taken four drachms he was seized with the peculiar feeling of being isolated from the external world, and with an irresistible inclination to gymnastic exercise, so that he who in his normal condition carefully avoided the latter, jumped with ease upon the writing-table without breaking the lamp or other objects upon it. After this a state of torpidity came on, accompanied by a feeling of intense comfort—consciousness being all the time perfectly clear—and by an instinctive wish not to move a limb during the whole day, not even a finger. During this sensation sleep sets in, attended by odd and rapidly changing dreams; it may last a whole day without leaving a feeling of debility or indisposition of any kind. The author increased the dose to eighteen drachms in one day; his pulse rose in consequence of it to one hundred and thirty-four, and in the moment when delirium was most intense, he described his feelings to several of his colleagues, who observed him, in the following written words: "*Iddio é ingiusto perche ho fatto l'uomo incapace di poter vivere sempre cocheando*" (this is the expression

for intoxication by coca.) "*Io preferiscta una vitta di* 10 *anni con coca che un di* 1,000,000 *secoli senza coca.*" After three hours of sleep, Dr. Mantegazza recovered completely from this intoxication, and could immediately follow his daily occupation without the least indisposition—on the contrary, even with unusual facility. He had abstained for forty hours without food of any kind, and the meals then taken were very well digested. From this fact, the author finds it explainable that the Indians employed as carriers of the mail are able to do without food for three or four days, provided they are sufficiently supplied with coca.

From these experiments, made repeatedly on himself, and on other individuals, Dr. Mantegazza draws the following conclusions:—

1. The leaves of the coca, chewed or taken in a weak infusion, have a stimulating effect upon the nerves of the stomach, and thereby facilitate digestion very much. 2. In a large dose coca increases the animal heat and augments the frequency of the pulse, and consequently of respiration. 3. In a medium dose, three to four drachms, it excites the nervous system in such a manner, that the movements of the muscles are made with greater ease—then it produces a calming effect. 4. Used in a large dose it causes delirium, halluciations, and finally congestion of the brain.

The most prominent property of coca, which is hardly to be found in any other remedy, consists in the exalting effect it produces, calling out the power of the organism without leaving afterwards any sign of debility. The coca is in this respect one of the most powerful nervines and analeptics. These experiments, as well as the circumstance that the natives have used the coca, from the earliest period as a remedy in dyspepsia, flatulency and colic, have induced Dr. Mantegazza, and several of his colleagues in South America and Europe, to employ the leaves of the coca in a variety of cases, partly as masticatory, partly in powder, as infusion, as alcoholico-aqueous extract in the dose of ten to fifteen grains in pills, and as a clyster. Dr. Mantegazza has used coca with most excellent results in dyspepsia, gastralgia, and entralgia; he employed it not less frequently in cases great of debility following typhus fever, scurvy,

anæmic conditions, &c., and in hysteria and hypochondriasis, even if the latter had increased to weariness of life. The coca might also be employed with great benefit in mental diseases where some physicians prescribe opium. Of its sedative effect in spinal irritation, idiopathic convulsions, nervous erethism, the author has fully convinced himself. He proposes its use in the highest dose in cases of hydrophobia and tetanus. It is a popular opinion that the coca is a reliable aphrodisiac; the author has, however, observed only two cases in which a decided influence upon the sexual system was perceived.

Dr. Mantegazza, finally, recommends this remarkable plant, which could be easily introduced into trade, to the profession for further physiological and therapeutical experiments, and adds the full history of eighteen cases by which the medicinal virtues of the remedy are proved to satisfaction.—*London Pharm. Journ.*, June, 1860, *from Oesterreichische Zeitschrift für Praktische Heilkunde*, November 4, 1859.

BASSIA FLOWERS.

Few trees have economic applications so numerous and so important as the Bassia trees of India. The wood of *Bassia longifolia* L. is hard and durable; its bark and leaves are used by the natives in medicine. Of the fruit, ripe or unripe, the skin boiled to a jelly is eaten with salt and capsicum. The ripe kernels afford an oil which is employed for culinary purposes as well as for lamps, for soap-making, and in medicine. The flowers which are produced in immense quantity, are gathered as they drop to the ground, and eaten as good food, either raw or roasted or boiled to a jelly.

These valuable properties are shared to a great extent by *Bassia latifolia* Roxb., a closely allied species also abundant in India. The flowers of this species also serve as food to both man and animals. They are used likewise for the preparation of an alcoholic spirit which is obtained from them by distillation. "This flower," says Dr. Alexander Gibson, Government Conservator of Forests in Bombay, "is collected in the hot season by Bheels and others, from the forests, also from the planted

trees which are most abundant in the opener parts of Guzerat and Rajwarra. The ripe flower has a sickly sweet taste, resembling manna. Being very deciduous, it is found in large quantity under the trees, every morning during the season. A single tree will afford from 200 to 400 pounds of the flowers. The seed affords a great quantity of concrete oil, used in the manufacture of soap. The forest or Bheel population also store great quantities of the dried flowers as a staple article of food; and hence in expeditions undertaken for the punishment or subjection of those tribes when unruly, their bassia-trees are threatened to be cut down by the invading force, and this threat most commonly ensures the submission of the tribes.

"In Guzerat and Rajpootna, every village has its spirit shop for the sale of the distilled liquor from the flowers; in the island of Caranja, opposite to Bombay, the government duty on the spirit distilled (chiefly from the flower) amounts to at least £60,000 per annum; I rather think that £80,000 is most generally the sum. The Parsis are the great distillers and sellers of it in all the country between Surat and Bombay; and they usually push their distilleries and shops into the heart of the forest, which lines the eastern border and hills of those countries. The spirit produced from the Bassia is, when carefully distilled, much like good Irish whiskey, having a strong, smoky, and rather fœtid flavor; this latter disappears with age. The fresh spirit is, owing to the quantity of aromatic or empyreumatic oil which it contains, very deleterious, and to the European troops stationed in Guzerat some thirty years ago, appeared to be quite as poisonous as the worst new rum of the West Indies. It excited immediate gastric irritation, and on this supervened the malarious fever so common in those countries."*

Under their Tamil name *Elloopa*, the flowers of *Bassia longifolia* L. have lately been imported into London, we presume as an experiment to ascertain if they can find here any useful applications. The sample we have examined consists of fleshy corollas, of a ferruginous brown color and moist appearance as

*Note on the various Vegetable Substances used in India for the purpose of producing Intoxication. Hooker's Journ. of Bot., vol. v. (1853,) p. 90.

if they had been preserved in sugar. They have a sweet taste, and an odor that reminds one of dried fruit. When steeped in water they regain their natural dimensions, and are then seen to be 5 or 6 tenths of an inch long by about 4 tenths broad, and to consist of a thick and fleshy gibbous tube, bordered with eight small, thin, broadly lanceolate petals. Attached to the interior of the tube, and almost sessile, are the stamens in a double row, numbering from 16 to 18.—D. H.

London Pharm. Journ., June, 1860.

TRANSFORMATION OF STARCH INTO DEXTRINE AND GLUCOSE.

M. Musculus believes (Comptes Rendus, t. l. p. 784,) that the formation of dextrine and glucose is rather the result of a decomposition of the amylaceous matter than the simple assimilation of water. His reasons for supposing so are: 1. That diastase has no action on dextrine. 2. That dextrine and glucose appear simultaneously when starch is acted on by diastase, and always in the same relation, *viz.* (1), equivalent of glucose and (2), equivalents of dextrine. 3. That dilute sulphuric acid acts at first in the same way as diastase, but differs in this, that the reaction continues after all the starch has disappeared, only more slowly. If glucose be formed from dextrine by the assimilation of water, it is difficult to understand why its formation should be more rapid while some unchanged starch remains in the liquor than when only dextrine remains: the contrary ought to be the case. 4. The simultaneous appearance of dextrine and glucose takes place with sulphuric acid as well as diastase, and the proportions are the same.

The practical conclusions which the author draws from the facts are: 1. That in the manufacture of glucose, if we regard the action as finished when the liquor is no longer blued by tincture of iodine, a large quantity of dextrine remains mixed with the sugar, and as dextrine does not ferment with yeast a great loss is caused to the consumer. The manufacturers ought therefore to employ a higher temperature, and leave the acid and starch a longer time in contact. 2. The great resistance which dextrine offers to the action of dilute sulphuric acid

furnishes an easy means of estimating a mixture of cane sugar and dextrine. Boiling for a minute with the acid is sufficient to modify all the cane sugar, so as to render it fit for the cupropotassic tartrate test, while the dextrine undergoes no change in the same time. If any starch were present at the same time it might be got rid of by diastase, which has no action either on the cane sugar or dextrine. 3. The action of diastase explains how it is that brewers are obliged to employ an enormous quantity of barley to obtain a beer with but little alcohol: two thirds of the starch pass into dextrine. 4. That in making spirit from malt there is an inevitable loss of two thirds.—*Chem. News, London, May* 19, 1860.

PREPARATION OF NICOTINA.

M. Debize (Moniteur Scientifique, p. 691,) prepares nicotina by placing a mixture of lime and powdered tobacco in a cylinder and passing through it a current of heated steam. The opposite end of the cylinder to that at which the steam enters is connected with a worm which condenses the steam and the products carried along with it, nicotina, ammonia, and some undefined bases. In order to separate the nicotina the liquid is neutralized with sulphuric acid and then concentrated by evaporation. When sufficiently concentrated it is treated with ammonia and ether, by which means an ethereal solution of nicotina is obtained which can be easily separated and the nicotina purified by rectification.—*Chem. News, London, May* 26, 1860.

THE MAGNESIAN LIGHT.

Magnesium is well known as the metallic bases of magnesia; it is much lighter than aluminium, as its specific gravity is only 1·74; it is of a silvery whiteness, undergoes no change in dry air, and is subject to but slow oxidation in a damp atmosphere, and that only quite superficially; it may be hammered, filed, and drawn into threads. At the beginning of the present century its properties were developed by Davy, and still more thoroughly by Bussy. To obtain it pure is an expensive process; and as no practical advantage could hitherto be made of

it, no one had attempted to discover a cheaper method of getting it. It was reserved to Bunsen to perceive a new property in this metal, and to suggest a practical application of it. Magnesium takes fire at the temperature at which glass melts, and burns with a steady and extremely vivid flame. In some photochemical investigations by Bunsen and Roscoe, experiments were made to test the illuminating capacity of a magnesium thread, when Bunsen discovered that the splendor of the sun's disc was only 524 times as great as that of the thread. Bunsen also compared the magnesium flame with ordinary lights, and found that a burning thread of 0·297 millimetres diameter produces as much light as 74 stearine candles, of which five go to the pound. It is plain that it only needs a mechanical device to spin magnesium, when heated into the form of a thread, upon spools, from which they can be run off like the strips of paper in Morse's telegraphic apparatus, to render it of practical use. Such a magnesium lamp-wick would be far more simple and complete than the preparations for the use of the electric or the Drummond light. A spool with its thread, a clock-work to wind it off, with the spirit lamp, would be easily transportable. A rival, therefore, to the strong lights hitherto used is like to spring up in Bunsen's magnesium-lamp, in all those cases where the item of expense is likely to be slightly regarded; for example, in brilliant illuminations, light-houses, &c.; for extraordinary degrees of illumination may be obtained by burning several of these threads of large dimensions at once.—*Chem. News, London, June* 9, 1860, *from Engineer.*

ON A NEW METALLIC ELEMENT.

Von Kobell has discovered in euxenite, æschynite, and samarskite, and a tantalite from Tammela, a new metallic acid belonging to the same group with tantalic and niobic acids. To the new metal contained in this acid, the author has given the (not very well selected) name of *Dianium.* When dianic acid, as precipitated by ammonia from its solution in chlorhydric acid, is boiled with chlorhydric acid and metallic tin, a beautiful deep sapphire blue solution is produced, which remains blue after filtration. When tantalic acid, from the tantalite of

Kimeto, or niobic acid from Bodenmais, are treated in the same way, the solution becomes bluish; and on adding water, the color quickly vanishes, and the solution, on filtering, passes through colorless.

When dianic acid is boiled with chlorhydric acid and zinc, instead of with tin, the blue solution does not appear, the precipitated acid becomes blue, but filters colorless, and is decolorized by water without being sensibly dissolved. When equal quantities of dianic, tantalic, and hyponiobic acids are boiled with concentrated chlorhydric acid, upon a funnel of platinum-foil for three minutes, all three give yellowish milky liquids; if water be then added, the solution of dianic acid becomes perfectly clear, while the tantalic and hyponiobic acids remain undissolved.

When freshly precipitated dianic acid is heated to boiling with dilute sulphuric acid, the milky liquid poured into a glass, and grains of distilled zinc thrown in, the dianic acid in a few moments becomes smalt blue, even dark blue, and retains this color for some time on addition of water; but the liquid passes through the filter colorless. In this respect, dianic acid resembles hyponiobic acid, while tantalic acid, under the same circumstances becomes pale blue, and immediately loses this color on addition of water. In this manner, tantalic may be distinguished from dianic and hyponiobic acids. The relations of the three acids to chlorhydric acid and tin, and to sulphuric acid and zinc, are thus sufficient to distinguish them from each other.

Dianic acid appears to exist, though in a less pure state, in the tantalite from Greenland, in pyrochlore from the Ilmengebirg, and in the brown Wöhlerite—though the author had but small quantities of these minerals at his disposal. A small piece of black yttrotantalite, believed to be from Ytterby, gave the reaction of dianic acid. A second specimen, however, the specific gravity of which was found to be 5·55, contained tantalic acid.

Titanic acid is easily distinguished from the other acids of the same group, by boiling it with muriatic acid and tin, and diluting the solution with water. The blue color then passes to rose red, and the solution retains this color several days. When dianic acid is present, the blue color predominates, but after standing some hours the rose color of titanic acid appears.

The tantalite from Tammela, which Von Kobell terms dianite, has a specific gravity of 5·5—while the other tantalites vary in density from 7·06 to 7·5. The streak of dianite is dark grey, while that of the tantalites from Tammela is dark brown red. Before the blowpipe, dianite exhibits no sensible difference from the tantalite of Kimeto.

H. Rose, to whom Von Kobell sent a specimen of dianic acid for examination, considered it probable that the peculiar reactions of this substance might be due to the presence of tungstic acid. Von Kobell has, however, shown by special experiments, that this is not the case. In conclusion, the author recommends those who desire to repeat his experiments, to employ the same proportions of water, acid, etc., of which he himself made use, and for the details of which we must refer to the original paper. —*Silliman's Journal, from Bull. der Acad. der Wissenschaften*, March 10th, 1860, (Munich).

NOTE ON THE EXTENT TO WHICH MERCURY VOLATILIZES ALONG WITH THE VAPOR OF WATER AT 100° C.

By J. W. Mallet.

In Berzelius' Traité de Chimie it is stated that Stromeyer drew attention to the fact of the evaporation of mercury in considerable quantity at 60° to 80° C. with the vapor of water, the more volatile substance carrying with it the less volatile, as in the case of a solution of boracic acid when heated.

This fact does not seem to have been very generally noticed by the compilers of chemical text-books in treating of the history of mercury, though it was always stated that the metal is capable of volatilizing *to a very slight extent*, even when alone, at the common temperature of the atmosphere. Some doubt too would seem to have been thrown upon Stromeyer's observation by the experiments made, under peculiar conditions, by Fresenius, and reported by him in the appendix to his treatise on quantitative analysis. It was found that 6·4402 grm. of mercury, *covered* with a considerable quantity of water, and heated to the boiling point of the latter for a quarter of an hour, lost but ·0004 grm., while exposure to the air at summer heat for six days produced a further loss of ·0005 grm.

I have lately observed the tolerably rapid evaporation of the metal with steam, produced not from a mass of water covering the quicksilver, but from a porous and highly absorptive clay which was dry to the touch, but gave off some eight or ten per cent of water when heated to 100° C. A specimen of this soil had been in contact with mercury, and several grams. of the metal in small globules had become mixed up with the mass. It was placed in the common copper box with double sides which serves as a steam-bath, and exposed to the temperature of boiling water. In half an hour I was surprised to see that the little piece of glass tube through which the heated air and vapor from the inside of the steam-bath escapes was coated with a bright specular deposit of metallic mercury. This was brushed off, and the tube replaced, when again it became in a short time similarly coated. The steam-bath was kept in constant use in drying this and other specimens of soil for twenty or thirty hours, and in this time between four and five grains of mercury was collected from the glass tube. Doubtless the condensation of the mercury vapor on the latter must have been far from complete—a large proportion of mercury probably escaped into the atmosphere. At any rate it seems clear that the metal can volatilize in very considerable amount when surrounded by vapor of water at 100° C., and not at the same time pressed upon or affected by the cohesion of a mass of liquid water. Hence an obvious necessity for thoroughly effective condensation when mercury is to be determined in its compounds by ignition with soda-lime.—*Silliman's Journal, July*, 1860.

ON THE DROP AND MINIM MEASURE.

By Mr. Barnard S. Proctor.

What is meant by "gtt."?

This is a question which the dispenser must often ask himself, and find difficulty in deciding upon any fixed answer which will serve all occasions, or in deciding upon any rule which will guide him as to which of two or three meanings he should attach to the term as various occasions arise.

It has been more than once pointed out that a drop varies much in size according to the form and size of the vessel from

which it falls—also that it varies according to the density and viscosity of the fluid, and according to some other of its qualities not yet well understood.

There can be no doubt that it would be much better on the part of the prescriber to do away with the term "gtt." altogether; but while it is used, sometimes to express a minim, and sometimes two-thirds of a minim, and sometimes a drop, without any definite idea of its value, it remains with us to decide, as best we can, how much tincture of digitalis or hydrocyanic acid is to be used in obedience to the physician's order of "gtt. xij." If all were agreed, it would probably be best to understand minims when guttæ are prescribed, which uniformity of practice might probably be obtained by adding a note to the table of measures in the Pharmacopœia, to the effect that minims shall, for the future, take the place of drops; and this would probably also expedite the disuse of the ambiguous term by the profession.

There are, however, certain circumstances under which quantity may be advantageously estimated by drops. If a few minims of a powerful tincture are ordered in a draught, the minim meter is at once convenient and accurate; but if a few minims of oil are to be added to a pill mass, the case is otherwise—the proportion adhering to the measure being large and difficult of removal.

With the view of facilitating accuracy in such-like cases, I have ascertained the number of drops equal to f℥j. of various essential oils, &c., when dropped from the bottles in which they are respectively kept, and have marked these numbers permanently upon the bottles, thus—Ol. Menth. P., 110; Ol. Caryophyl, 90; so that if ♏xij. of either of these are prescribed, twenty-two drops of the former or eighteen of the latter may be used. It is not necessary to trouble about the comparative fluidity of the various liquids, or the thickness of the bottle lip; but it is necessary to see that the dropping is always performed in the same manner: fifty-four drops of hydrocyanic acid equalled f℥j., when each drop fell clearly from the lip of the phial; but if the stopper were not entirely removed, and the drop fell conjointly from the stopper and lip of the phial, thirty-two drops filled the same measure.

I subjoin a few of the numbers thus in use:—

Ol. Tiglii.,	100	drops =	fʒj.	Tr. Digital.,	96	drops =	fʒj.
" Lavand. Ang.	120	"	"	Tr. Opii,	108	"	"
" " Exot.	95	"	"	Creasote,	110	"	"
" Carui.,	98	"	"	Acid. Hydrochl.,	45	"	"
" Menth. P.,	110	"	"	" Nitric.,	72	"	"
" Caryophyl,	90	"	"	" Hydrochl. dil.	65	"	"
Otto Rosæ,	150	"	"	" Hydrocyan.,	54	"	"
Chloroform,	250	"	"				

Dr. Pereira says of chloroform:—"The dose internally may be from five to twenty minims, or more. The physicians of the United States have been in the habit of prescribing it in much larger doses;" and quoted several cases in which from 76 to 100 *drops* were given. Probably these doses were not greater than those of his own prescribing.

A reference to the table will also show the difference between selling otto of roses by the drop and by the drachm in a stronger light than some of your readers may have hitherto seen it.

There might be other points of interest considered in connexion with this table, but I will not add more, save a word of caution against any one adopting the numbers above given without direct experiment in each case.—*Lon. Pharm. Journ. July* 2, 1860.

GENERAL COUNCIL OF MEDICAL EDUCATION AND REGISTRATION.

Report of the Pharmacopœia Committee.

At a meeting of the Council, held at the Royal College of of Physicians, London, on the 16th June,

Present—Sir Benjamin C. Brodie, President, in the chair; Dr. Burrows, Mr. Green, Mr. Nussey, Dr. Bond, Dr. Embleton, Do. Storrar, Dr. Alexander Wood, Dr. Andrew Wood, Mr. Watt, Mr. Syme, Dr. A. Thomson, Dr. A. Smith, Dr. Williams, Dr. Leet, Dr. Apjohn, Dr. Corrigan, Sir James Clark, Sir Charles Hastings, Mr. Lawrence, Mr. Teale, Dr. Christison, Dr. Stokes, Dr. F. Hawkins, *Registrar.*

Dr. Christison presented the following report of the Pharmacopœia Committee, which was received and ordered to be printed in the minutes:—

"*Report of the Pharmacopœia Committee, June 16th*, 1850.

"The Committee appointed by the General Council of Medical Education and Registration beg to submit to the Council the following Report of the progress made towards the completion of the 'British Pharmacopœia.'

"The British Pharmacopœia consists of two parts, and an Appendix. In the first is contained a list of all substances employed in the treatment of disease. It is, in fact, a complete list of the materia medica. Each substance is introduced, with its Latin or scientific name, the English translation of the same, its definition, and its source. These constitute the really officinal portion of the first part. It is, however, proposed to append to each article some of the more important characters by which it may be recognized, and the tests by which its purity may be ascertained; and, lastly, the names of the different officinal preparations, into which it enters as an important ingredient, will be enumerated. This part of the Pharmacopœia has been completed, as far as the number of substances to be introduced is concerned; and has been divided into three portions, which have been allotted to the different Sub-Committees.

"The Dublin Committee have made considerable progress in their third part, and also completed some of the more important processes for the metallic preparations.

"The Edinburgh Committee have devoted considerable attention to their part of the work, and could finish it in a short period of time.

"The London Committee have completed about half their share, and the remainder is in a forward state. Specimen pages, illustrating the mode in which this portion of the work is proposed to be framed, have been prepared for submission to the Committee.

"The list of the materia medica, or first part of the Pharmacopœia, is necessarily, for various reasons, in a less advanced state than the second half; but it is, at the same time the portion which may be speedily finished, when the various groups of officinal preparations are framed. Its completion requires little or no experimental inquiry, but necessarily demands that the Galenical preparations should have been definitely determined upon.

"The second part of the British Pharmacopœia consists of different groups of the preparations of substances contained in the first, together with the processes for preparing the metallic or other chemical drugs. The proposed groups, often named Galenical, are the following:—The acids, confections, cataplasms, decoctions, enemata, extracts, honey, &c., infusions, liniments, lozenges, mixtures and mucilages, ointments, plasters, pills, spirits, syrups, tinctures, vinegars, waters, and wines.

"To the Edinburgh Committee have been allotted the cataplasms, decoctions, honeys, lozenges, plasters, syrups, and waters.

"To the Dublin Committee, enemata, infusions, mixtures and mucilages, pills, tinctures, wines, and ointments.

"To the London Committee, the acids, confections, extracts, liniments, powders, spirits, and vinegars.

"Each group, when completed by any Committee, has been sent to the other Committees, received their comments, and then revised by the Committee who originally framed it.

"The secretary of the Edinburgh Sub-Committee reports that all the groups specially allotted to it have been drawn up and transmitted for revision to one or other of the associate Committees, and that this Committee has likewise commented upon the mixtures and mucilages, infusions, powders, confections, enemata, and ointments; and, lastly, it has re-examined most of its own groups, after receiving the comments of the other Committees.

"The Dublin Committee has constructed all the groups allotted to it; has transmitted them to the other Committees; has received the comments of the associate Committees upon the ointments, enemata, infusions, mixtures and mucilages, and replied to them.

"It has also considered and reported upon the acids, honeys, lozenges, confections, powders, decoctions, waters, and plasters, received either from the London or Edinburgh Committees.

"The London Committee has framed all the groups allotted to it, with the exception of the extracts; this group has been deferred, in order to allow experiments to be made during the present summer season; but it is now in a very forward state, and will soon be ready for transmission to Dublin and Edinburgh.

"The London Committee has also carefully revised and commented upon all the groups received from Edinburgh and Dublin; in fact, upon all the Galenical groups, with the exception of the tinctures and wines; and, lastly, it has revised some of its own preparations, after having taken into consideration the criticisms of the associate Committees.

"A portion of the second part of the Pharmacopœia has been set up in type, for the purpose of being submitted to the Committee.

"Having passed over in review the work which has already been accomplished by the Pharmacopœia Committee, it remains to be shown what is still incomplete, and the probable time required for its completion.

"To complete the second part of the Pharmacopœia, a few weeks only would be required, as far as the Sub-Committees are concerned.

"The first portion of the work might probably occupy a month or two longer, requiring some points to be arranged by conference; and lastly the Appendix—which will contain the substances employed in the preparation of chemicals, but not themselves used as medicines, together with the tests for the detection of the qualities of drugs—might be estimated to occupy about a month.

"Should the Sub-Committees continue to work diligently, it is probable that the work might be prepared for press by the middle or latter end of November; but to ensure this, it may be necessary that at least one meeting of the General Committee, formed by deputies from the different Sub-Committees, should be held previous to that time."

Dr. Christison further reported from the Pharmacopœia Committee, that the Committee had felt it advisable to refer to the General Medical Council for instructions as to the powers of the Committee in certain parts of the business entrusted to them by the Council. The Council were of opinion that the Committee had rightly interpreted their powers. In connexion with this opinion, Dr. Christison, as requested by the Pharmacopœia Committee, moved the following resolutions, which were seconded by Dr. Storrar, and agreed to by the Council:—

"1. That it be remitted to the Pharmacopœia Committee, either to dispose of the forthcoming edition of the British Pharmacopœia to a publisher or publishers, or to publish the edition as the property of the General Medical Council, according as the Committee shall judge to be expedient."

"2. That, in the event of the Committee resolving to sell the edition, the Executive Committee of the General Medical Council shall have the power to grant, in favor of the publisher of the work, such title in the property of it as the General Council can grant."

"3. That the sum of 500*l.* be voted by the General Medical Council, in addition to the vote of November 24th, 1858, towards defraying the current expenses of the Pharmacopœia Committee."—*Lon. Pharm. Journ. July*, 1860.

MEANS OF DETECTING THE ADULTERATION OF CHINESE RHUBARB WITH THE AID OF ESSENTIAL OILS.

By Emile Rillot, Pharmacien à Mutzig (Bas-Rhin).

Chinese Rhubarb has at all times been sufficiently high in price to form a temptation to the cupidity of adulterators. M. Chevallier, in his *Treatise on Adulterations*, says that, in 1846, there was cultivated in the suburbs of Paris a species of rhubarb, which was sold as foreign to the pharmaciens in the country. This rhubarb could not well be sold to the public whole, for the fraud was too evident; but it is probable that it was powdered and then mixed in varying proportions with Chinese rhubarb. The mixture of powdered Rhapontic with Chinese rhubarb is difficult to discover, for the color, odor, and taste of Rhapontic, although more feeble, are nevertheless very analogous to Chinese. The trials which I have made to detect this adulteration have produced some results, which will, I believe, be useful to my brethren, and enable them to discover even the

smallest quantities of Rhapontic rhubarb mixed with Chinese rhubarb.

When the different varieties of rhubarb are treated with nitric acid, a peculiar coloration is produced, which M. Garot has designated by the name of *érythrose*. This coloration is yellow with the indigenous rhubarbs, and orange with the exotic kinds. The essential oils produce an inverse effect, that is to say, Rhapontic rhubarb produces a coloration which varies from orange to flesh color, whilst Chinese rhubarb experiences no change of color.

The following tables show the reactions obtained by means of different portions of Rhapontic rhubarb mixed with Chinese rhubarb.

When equal parts of Chinese rhubarb and magnesia are mixed together, a yellowish color is produced; when this is diluted with a further quantity of magnesia, and some essence of aniseed added, this coloration remains the same; but when we take equal parts of Rhapontic rhubarb and carbonate of magnesia and add essence of aniseed, there is produced after a strong trituration for five minutes a reddish-orange salmon color. By this means alone we can distinguish powdered Chinese rhubarb from that of Rhapontic; but my trials have been principally carried on upon the coloring action of mixtures of Rhapontic and Chinese rhubarb. The following is the order in which I have made these trials:—

No. 1.

Chinese Rhubarb..... 2 grammes.
Calcined or Carbonate of Magnesia..... 2 grammes.
Essence of Aniseed..... 20 drops.

After trituration for five minutes, we obtain but little difference of coloration.

No. 2.

Rhapontic Rhubarb..... 2 grammes.
Carbonate of Magnesia..... 2 grammes.
Essence of Aniseed..... 20 drops.

After a trituration for five minutes, we obtain an organic-salmon coloration; the powder attached to the pestle has the appearance of red lead (*minium*).

No. 3.

Rhapontic Rhubarb..... 2 grammes.
Calcined Magnesia..... 2 grammes.
Essence of Aniseed..... 20 drops.

After a trituration for five minutes, we obtain a very intense rose-salmon coloration.

No. 4.

Rhapontic Rhubarb	2 grammes.
Calcined Magnesia	2 grammes.
Carbonate of Magnesia	2 grammes.
Essence of Aniseed	20 drops.

After a trituration for five minutes, we obtain a lively rose-salmon color, but the rose is more evident than that in No. 3.

No. 4 *bis*.

Rhapontic Rhubarb	50 centigrammes.
Chinese Rhubarb	50 centigrammes.
Calcined Magnesia	2 grammes.
Carbonate of Magnesia	2 grammes.
Essence of Aniseed	20 drops.

After a trituration for five minutes, we obtain a rose-flesh-salmon color.

No. 5.

Rhapontic Rhubarb	30 centigrammes.
Chinese Rhubarb	70 centigrammes.
Calcined Magnesia	2 grammes.
Carbonate of Magnesia	2 grammes.
Essence of Aniseed	28 drops.

After a trituration for five minutes, we obtain again the same coloration as in No. 4 *bis*.

And whenever the quantity of powdered Rhapontic rhubarb is diminished, we constantly obtain a more or less deep rosy coloration. We can, by this means, discover the slightest trace of Rhapontic rhubarb; but it is necessary to observe, that it is much better to employ simultaneously the two kinds of magnesia, for the carbonate gives a coloration more yellowish-red, leaning to rose, whilst calcined magnesia produces a coloration more decidedly rose. The essential oils of bergamot, citron, &c., produce similar reactions. The essence of mint decolorizes, so to speak, at first (and only after a long trituration), the mixture of Chinese and Rhapontic rhubarbs; but the rose color is soon restored; whilst with the Chinese rhubarb it produces only a dull grey color.—*London Pharm. Journ.*, *July* 2, 1860, *from Journal de Chimie Médicale*, June, 1860.

ON THE ARSENIC EATERS OF STYRIA.

By Charles Heisch, Esq., F.C.S.

Lecturer on Chemistry at the Middlesex Hospital Medical College.

At the last meeting of the Manchester Philosophical Society I observe that Dr. Roscoe called attention to the arsenic eaters of Styria. Having for the last two years been in communication with the medical men and other residents in the districts

where this practice prevails, I shall feel obliged if you will allow me through your journal to make known the facts I have at present collected. The information is derived mainly from Dr. Lorenz, Imperial Professor of Natural History, formerly of Salzburg, from Dr. Carl Arbele, Professor of Anatomy in Salzburg, and Dr. Kottowitz, of Neuhaus, besides several non-medical friends. If human testimony be worth anything, the fact of the existence of arsenic eaters is placed beyond a doubt. Dr. Lorenz, to whom questions were first addressed, at once stated that he was aware of the practice, but added, that it is generally difficult to get hold of individual cases, as the obtaining of arsenic without a doctor's certificate is contrary to law, and those who do so are very anxious to conceal the fact, particularly from medical men and priests. Dr. Lorenz was, however, well acquainted with one gentleman, an arsenic eater, with whom he kindly put me in communication, and to whom I shall refer again more particularly. He also says that he knows arsenic is commonly taken by the peasants in Styria, the Tyrol, and the Salzkammergut, principally by huntsmen and woodcutters, to improve their wind and prevent fatigue. He gives the following particulars:—

The arsenic is taken pure in some warm liquid, as coffee, fasting, beginning with a bit the size of of a pin's head, and increasing to that of a pea. The complexion and general appearance are much improved, and the parties using it seldom look so old as they really are, but he has never heard of any case in which it was used to improve personal beauty, though he cannot say that it never is so used. The first dose is always followed by slight symptoms of poisoning, such as burning pain in the stomach and sickness, but not very severe.

Once begun it can only be left off by very gradually diminishing the daily dose, as a sudden cessation causes sickness, burning pains in the stomach, and other symptoms of poisoning, very speedily followed by death.

As a rule, arsenic eaters are very long lived, and are peculiarly exempt from infectious diseases, fevers, &c.; but unless they gradually give up the practice invariably die suddenly at last.

In some arsenic works near Salzburg with which he is ac-

quainted, he says the only men who can stand the work for any time are those who swallow daily doses of arsenic, the fumes, &c., soon killing the others. The director of these works, the gentleman before alluded to, sent me the following particulars of his own case. (This gentleman's name I suppress, as he writes that he does not wish the only thing known about him in England to be the fact that he is an arsenic eater; but if any judicial inquiry should arise which might render positive evidence of arsenic eating necessary, his name and testimony will be forthcoming.)

"At seventeen years of age, while studying assaying, I had much to do with arsenic, and was advised by my teacher, M. Bönsch, Professor of Chemistry and Mineralogy at Eisleben, to begin the habit of arsenic eating. I quote the precise words he addressed to me. 'If you wish to continue the study of assaying, and become hereafter superintendent of a factory, more especially of an arsenic factory, in which position there are so few, and which is abandoned by so many, and to preserve yourself from the fumes which injure the lungs of most, if not of all, and to continue to enjoy your customary health and spirits, and to attain a tolerably advanced age, I advise you, nay, it is absolutely necessary, that besides strictly abstaining from spirituous liquors, you should learn to take arsenic; but do not forget when you have attained the age of fifty years gradually to decrease your dose, till from the dose to which you have become accustomed, you return to that with which you began, or even less.' I have made trial of my preceptor's prescriptions till now, the forty-fifth year of my age. The dose with which I began, and that which I take at present, I enclose; they are taken once a day, early, in any warm liquid, such as coffee, but not in any spirituous liquors." The doses sent were No. 1, original dose, three grains; No. 2, present dose, twenty-three grains of pure white arsenic in coarse powder. Dr. Arbele says this gentleman's daily dose has been weighed there also, and found as above. Mr. —— continues:—"About an hour after taking my first dose (I took the same quantity daily for three months), there followed slight perspiration with griping pains in the bowels, and after three or four hours a loose evacuation; this was followed by a keen appetite, and a feeling of

excitement. With the exception of the pain, the same symptoms follow every increase of the dose. I subjoin as a caution that it is not advisable to begin arsenic eating before the age of twelve or after thirty years." In reply to my question, if any harm results from either interrupting, or altogether discontinuing the practice, he replies, "Evil consequences only ensue from a long continued interruption. From circumstances I am often obliged to leave it off for two or three days, and I feel only slight languor and loss of appetite, and I resume taking the arsenic in somewhat smaller doses. On two occasions, at the earnest solicitations of my friends, I attempted entirely to leave off the arsenic. The second time was in January, 1855. I was induced to try it a second time from a belief that my first illness might have arisen from some other cause. On the third day of the second week after leaving off the dose I was attacked with faintness, depression of spirits, mental weakness, and a total loss of the little appetite I still had; sleep also entirely deserted me. On the fourth day I had violent palpitation of the heart, accompanied by profuse perspiration. Inflammation of the lungs followed, and I was laid up for nine weeks, the same as on the first occasion of leaving off the arsenic. Had I not been bled, I should most likely have died of apoplexy. As a restorative, I resumed the arsenic eating in smaller doses, and with a firm determination never again to be seduced into leaving it off, except as originally directed by my preceptor. The results on both occasions were precisely the same, and death would certainly have ensued had I not resumed arsenic eating." One of the most remarkable points in this narrative is that this gentleman *began* with a dose which we should consider poisonous. This is the only case of which I have been able to obtain such full particulars, but several others have been mentioned to me by those who knew the parties and can vouch for their truth, which I will briefly relate.

One gentleman, besides stating that he is well aware of the existence of the practice, says he is well acquainted with a brewer in Klagenfürth, who has taken daily doses of arsenic for many years. He is now past middle life, but astonishes every one by his fresh juvenile appearance; he is always exhorting other people to follow his example, and says, "See how strong and

fresh I am, and what an advantage I have over you all! In times of epidemic fever or cholera, what a fright you are in, while I feel sure of never taking infection."

Dr. Arbele writes, "Mr. Curator Kürsinger (I presume curator of some museum at Salzburg), notwithstanding his long professional work in Lungau and Binzgau, knew only two arsenic eaters—one the gentlemen whose case has just been related, the other the ranger of the hunting district in Grossarl, named Trauner. This man was at the advanced age of 81, still a keen chamois hunter, and an active climber of mountains; he met his death by a fall from a mountain height, while engaged in his occupation. Mr. Kürsinger says he always seemed very healthy, and every evening regularly, after remaining a little too long over his glass, he took a dose of arsenic, which enabled him to get up the next morning perfectly sober and quite bright. Professor Fenzl, of Vienna, was acquainted with this man, and made a statement before some learned society concerning him, a notice of which Mr. Kürsinger saw in the *Wiener Zeitung;* but I have not been able to find the statement itself. Mr. Krum, the pharmaceutist here, tells me that there is in Salzburg a well-known arsenic eater, Mr. Schmid, who now takes daily twelve and sometimes fifteen grains of arsenic. He began taking arsenic from curiosity, and appears very healthy, but always becomes sickly and falls away if he attempts to leave it off. The director of the arsenic factory before alluded to is also said to be very healthy, and not to look so old as 45, which he really is.*

As a proof how much secrecy is observed by those who practice arsenic eating, I may mention that Dr. Arbele says he inquired of four medical men, well acquainted with the people of the districts in question, both in the towns and country, and they could not tell him of any individual case, but knew of the custom only by report.

Two criminal cases have been mentioned to me, in which the known habit of arsenic eating was successfully pleaded in favor of the accused. The first by Dr. Kottowitz, of Neuhaus, was

*The man above mentioned seems quite to differ with Mr. ——— on the impropriety of taking arsenic with spirituous liquors, and actually employs it as a means of correcting their effects. All others that I have heard of, concur in saying that it should be taken fasting.

that of a girl taken up in that neighborhood on strong suspicion of having poisoned one or more people with arsenic, and though circumstances were strongly against her, yet the systematic arsenic eating in the district was pleaded so successfully in her favor, that she was acquitted, and still lives near Neuhaus, but is believed by every one to be guilty. The other case was mentioned by Dr. Lorenz. A woman was accused of poisoning her husband, but brought such clear proof that he was an arsenic eater, as fully to account for arsenic being found in the body. She was, of course, acquitted.

One fact mentioned to me by some friends is well worthy of note. They say: "In this part of the world, when a graveyard is full, it is shut up for about twelve years, when all the graves which are not private property by purchase are dug up, the bones collected in the charnel-house, the ground ploughed over, and burying begins again. On these occasions, the bodies of arsenic eaters are found almost unchanged, and recognizable by their friends. Many people suppose that the finding of their bodies is the origin of the story of the vampire." In the *Medicinischer Jahrbuch des Oster: Kaiserstaates*, 1822, *neuest Fölge*, there is a report by Professor Schallgruber, of the Imperial Lyceum at Grätz, of an investigation undertaken by order of government into various cases of poisoning by arsenic. After giving details of six *post-mortem* examinations, he says: "The reason of the frequency of these sad cases appears to me to be the familiarity with arsenic which exists in our country, particularly the higher parts. There is hardly a district in Upper Styria where you will not find arsenic in at least one house, under the name of hydrach. They use it for the complaints of domestic animals, to kill vermin, and as a stomachic to excite an appetite. I saw one peasant show another on the point of a knife how much arsenic he took daily, without which, he said, he could not live; the quantity I should estimate at two grains. It is said, but this I will not answer for, that in that part of the country this poison is used in making cheese; and, in fact, several cases of poisoning by cheese have occurred in Upper Styria, one not long since. The above-mentioned peasant states, I believe truly, that they buy the arsenic from the Tyrolese, who bring into the country spirits and other medicines, and so are

the cause of much mischief." This report is, I believe, mentioned in Orfila's *Toxicology,* and one or two other works, but I have not seen it quoted myself; it is interesting, as being early and official evidence of arsenic eating. Since I received the above information, a gentlemen who was studying at this hospital, told me that, when an assistant in Lincolnshire, he knew a man who began taking arsenic for some skin disease, and gradually increased the dose to five grains daily. He said he himself supplied him with this dose daily for a long time. He wrote to the medical man with whom he was assistant, and I have been for a long time promised full particulars of the case, but beyond the fact that he took five grains of arsenic, in the form of Fowler's solution, daily, for about six years, and could never leave it off without inconvenience, and a return of his old complaint, I have as yet not received them. I have delayed publishing these facts for some time, hoping to get information on some other points, for which I have written to my friends abroad; but as considerably delay takes place in all communications with them, I have thought it better to publish at once the information I have already received. All the parties spoken of are people on whom the fullest reliance can be placed, and who have taken much pains to ascertain the foregoing particulars. The questions which still remain unanswered are these:—

1st. Can any official report be obtained of the trials of the two people mentioned by Drs. Kottowitz and Lorenz?

2nd. Do medical men in these districts, when using arsenic medicinally, find the same cumulative effects as we experience here? Or is there anything in the air or mode of living which prevents it?

3rd. Can any evidence be obtained as to how much of the arsenic taken is excreted? To show whether the body gradually becomes capable of enduring its presence, or whether it acquires the power of throwing it off.*

I have proposed to the gentleman who furnished me with the particulars of his own case, either to make an estimate of the arsenic contained in his own urine and fæces during twenty-four

*The fact of the preservation of the bodies shows that some considerable quantity must be retained.

hours, or to collect the same and forward them to me that I may do so, but as yet have received no answer.—*London Pharm. Jour., May* 1, 1860.

GLEANINGS FROM ANNALEN DER CHEMIE UND PHARMACIE.

By John M. Maisch.

Behaviour of Sesquisalts of Iron to Sulphurous and Hyposulphurous Acid.—Hugo Schiff confirms the observations of Phillips and Schönbein, that sesquisalts of iron are rendered darker or red by SO_2. Sulphocyanide of iron—less readily a mixture of sesquichloride of iron and sulphocyanide of sodium—is decolorized, without being previously darkened; previous digestion of SO_2 with zinc, causes an instantaneous decolorization, likewise a solution of hyposulphite of soda. Lenz's observation, that other salts of $Fe_2\ O_3$ are for a short time colored violet by NaO,S_2O_2, is correct; it is only after several hours, that sulphur is separated, probably the result of a secondary reaction. (Vol. cxi. 366, 367.)

An alcoholic solution of Biniodide of Mercury continues, even after 15 months, to be precipitated by water in the yellow modification of the iodide. H. Schiff remarks that on the addition of water, the solution turns milky and separates, after several hours, tabular rhombic crystals, showing by polarization under the microscope beautiful spectra, which are not observed with the red crystals—(Vol. cxi. 371, 372.)

Reactions of Tincture of Guaiacum.—A trace of chlorine imparts to tincture of guaiacum an intensely blue color. H. Schiff has observed the following reactions: with iodine a dirty green, or no coloration, on the addition of water blue; acids prevent this reaction, not the neutral salts. The tincture when colored blue by Fe_2Cl_3, is rendered bright violet by NaO,S_2O_2; the liquid is rapidly decolorized; the same blue tincture is slowly decolorized by SO_2, but immediately, without imparting any purplish color, if the SO_2 has been previously digested with zinc. Resin of guaiacum dissolves in concentrated

SO_3 with a beautiful red color, which is altered by alcohol to violet blue, afterwards bluish green; water precipitates the solution purplish. If concentrated SO_3 is added to some iron filings, and the resulting gas conducted into tincture of guaiacum, this will assume a blue color, if nitric acid was present.—(Vol. cxi. 373.)

On the influence of Chlorous Acid upon Organic Substances.—J. Schiel, Ann. cxii. 73—80, has made some experiments, and obtained the following results: anhydrous glycerin absorbs a portion of gaseous ClO_3, when an explosion takes place; after that the reaction between the two bodies is progressing slowly, even in direct sunlight. By PbO ClO_3 and SO_3 alcohol is converted into acetic ether; amylic alcohol into valerianate of oxide of amyle. Urea dissolves in aqueous ClO_3 with evolution of CO_2 and probably NO, and is converted into a crystalline compound, having a slight acid reaction, soluble in alcohol and water, and of the composition $C_2N_2H_4O_2+NH_4Cl$; its chemical behaviour, however, does not coincide with this formula. Uric acid under the same circumstances yields pearly scales, soluble in water and boiling alcohol, and producing, after neutralization with soda, a crystalline precipitate with baryta and lead salts, and a curdy precipitate with nitrate of silver; the author calls it *chloraluric acid*, and has found its formula, $C_{14}H_{11}N_6ClO_{11}$. Besides this, another substance is formed which, on the application of heat, readily yields murexide.

On Quercitrin.—H. Hlasiwetz has studied the decomposition of quercitrin, (Annal. cxii. 96—118.) By hot potassa, quercetin yields sugar, (phloroglucin $C_{12}H_6O_6+4HO$,) quercetic acid, 2HO, $C_{34}H_{10}O_{14}+7HO$, and a body which appears to be a compound of two equivalents of the former, with one of the latter. Quercetic acid crystallizes, is soluble in alcohol, ether and hot water, is partly sublimable, colors Fe_2Cl_3 deep bluish black; its solution is colored yellow by alkalies, turning carmine red in contact with air. The formula for quercetin was found to be $C_{46}H_{16}O_{20}$, but it retains at 200°C. (392° F.) 1HO. The composition of quercitrin, as analysed by Bolley, must be $C_{70}H_{36}O_{40}$, of the author's and many other chemists' $C_{58}H_{30}O_{34}$, of Rochleder's, obtained

from the leaves of the horse chestnut, $C_{82}H_{46}O_{50}$, that is quercetin + 1, 2 and 3 equivalents of sugar.

Quercitrin has been discovered in Quercus tinctoria (Chevreul,) Ruta graveolens (Weiss & Kümmel,) Saphora japonica, (Stein,) Capparis spinosa, (Rochleder & Hlasiwetz,) Aesculus hippoc. (Rochleder,) and the author thinks it likely to exist in Rhamnus tinct. Reseda luteola and Thuja occid. Phloroglucin is interesting from being a constituent also of phloricin. The author mentions the following colors as capable of being produced from quercitrin and its compounds: yellow, by quercitrin and quercetin; brown, by quercitrin, alkalies and oxygen; green, by quercitrin and Fe_2O_3; blue by quercetic acid and Fe_2O_3; red, by quercetic acid, alkalies and oxygen; violet, by a combination of the last two, and by phloroglucin and Fe_2O_3.

On Kinovin.—Prof. H. Hlasiwetz found that kinovin yields sugar, when treated in alcoholic solution with muriatic acid gas. Dr. Gilm has farther investigated the subject, (Annal. cxi. 182—191.) The sugar is $C_{12}H_{12}O_{10}$ and resembles Berthelot's mannitan; the other product is of an acid nature, and to it properly belongs the name of kinovic acid, hitherto usually applied to kinovin. It consists of $2HO, C_{48}H_{36}O_6$, is tasteless, insoluble in water, soluble in much boiling alcohol, readily soluble in alkalies and their carbonates, yielding intensely bitter solutions, which are precipitated by the salts of the heavy metals. The composition of kinovin is $C_{60}H_{48}O_{16}$.

Determination of Albumen and Syntonin.—C. Boedeker attempted to estimate these two bodies by precipitating their solution in acetic acid, by ferrocyanide of potassium. If Lieberkühn's formula for albumen is doubled, viz. $C_{144}H_{112}N_{18}O_{44}S_2$, it requires one equivalent KCfo for complete precipitation; 1612 albumen yield with 211 KCfo+3HO, 1720 hydro-ferrocyanate of albumen. The formula for syntonin cannot vary much from $C_{144}H_{112}N_{18}O_{42}S$; these 1580 parts likewise require 211 KCfo+3HO and form 1688 hydro-ferrocyanate of syntonin. If 1.309 grm. crystallized KCfo+3HO is dissolved in 1000 cub. centimetres water, each c.cm. is completely precipitated by .01 grm. albumen. The solution of albumen is diluted with

its own bulk of acetic acid and filtered; 5 c.cm. of it are agitated with the same volume of the test liquid and filtered; the filtrate is usually turbid, if albumen is in excess, and is precipitated by KCfo and albumen; if the ferrocyanide is in excess, it is clear and precipitated only by albumen. In a second experiment, either the KCfo or the albumen is doubled, and the filtrate again tested; if necessary, a third and a fourth experiment is then made, in which the test liquid is adjusted in accordance with the previous result, until the point is ascertained, when the filtrate is not precipitated by either of the liquids.—(Vol.. cxi. 195—205.)

Synthesis of Acetic Acid.—J. A. Wanklyn passed carbonic acid into a mixture of sodium, zinc, and their compounds, with methyle; after amalgamating the free metals with mercury, the product was distilled with diluted sulphuric acid. The distillate contains acetic acid, the presence of ether has no influence on the result.—$2CO_2+Na$, $C_2H_3=C_4H_3NaO_4$. (Vol. cxi. 234—236.)

Estimation of Magnesia and the fixed Alkalies.—The presence of magnesia does not interfere with the estimation of potassa by bichloride of platinum. Prof. Th. Scheerer, therefore, proposes the following way: the whole amount of the above bases is estimated as their sulphates; from a weighed portion the magnesia is determined as pyrophosphate, the potassa from another portion as platina chloride; the remainder is soda.—(Ann. d. Ch. and Ph. cxii. 177, 178, from Nachr. d. K. Ges. d. Wiss. zu Goettingen.)

On Guaiac Resin.—Prof. Hlasiwetz prepares a concentrated solution, of one part of the resin in alcohol, precipitates with ½ part caustic potassa in alcohol, expresses the mother liquor, and washes the residue with alcohol, afterwards with water. This potassa salt crystallizes from a solution in much boiling diluted alcohol; dissolved in very diluted boiling potassa, muriatic acid precipitates the resinous acid, which crystallizes from its alcoholic solution on spontaneous evaporation, and possesses a faint but agreeable odor of vanilla; it is not rendered blue by oxidizing agents.—(Vol. cxii. 182—184.)

On Vegetable Parchment.—Prof. A. W. Hofmann, publishes in Ann. d. Ch. and Ph. vol. cxii. 243—256, a report made to Messrs. De la Rue & Co., of London about a year ago. The parchment is prepared by immersing for a few seconds, at 60° F., unsized paper in diluted sulphuric acid, the limits of dilution for four volumes of HO, SO_3 are between one and two vols. water. It is afterwards washed in water, then in diluted ammonia, and lastly again in water. Its composition is that of cellulose, its strength is five times greater than the unsized paper, and $\frac{3}{4}$ the strength of animal parchment, which otherwise it closely resembles. The honor of the scientific discovery in 1847, of this transformation of paper, belongs to Messrs. J. A. Poumaréde and L. Figuier, of Paris; but the perfection of the process is W. E. Gaine's work; the demand for this article already exceeds the supply.

On the equivalent weight of Manganium and Nickel.—Rawack determined the amount of water obtained from Mn_3O_4, when reduced in a current of pure hydrogen to MnO; R. Schneider ascertained the water and carbonic acid, yielded by the protoxalate $C_4Mn_2O_8+4HO$. The medium of 10 experiments was 27·019; Schneider puts the equivalent weight of manganium at 27. Agreeing with his formor experiments, Schneider again found the weight of equivalent of Ni=29·029.—(Pogg. Ann. cvii. Ann. d. Ch. and Ph. cxiii.)

Synthesis of Salicylic Acid.—Prof. Kolbe considers salicylic acid to be composed of carbonic acid and oxide of phenyle=$(HO, C_{12}H_5O)C_2O_4$. He and Lautemann have now discovered that salicylate of soda is formed, on passing carbonic acid into hydrated oxide of phenyle, while sodium is being dissolved therein; hydrogen is evolved.—(Ann. d. Ch. and Ph. cxiii. 125—127.)

On the composition of Petroleum.—A considerable quantity of petroleum is obtained near Sehnde, a village in the neighborhood of Hanover, Germany. In its crude state, it is greenish brown, rather thin, of a disagreeable odor, and contains a rather large proportion of paraffin. The rectified oil was the subject of investigations, by Drs. Bussenius and Eisenstuck, who found

it to consist of different carbohydrogens, some of which distil below 180° C., and partly form a crystallizing, nitro-compound under the influence of sulphuric and nitric acids. These carbohydrogens they call *petrole;* they appear to be composed of $C_{16}H_{10}$ and $C_{18}H_{12}$. Dr. Eisenstuck attempted to separate the various constituents, by repeated fractional distillations, from 5 to 5°C.; but after continuing it for seven weeks, he had not been able to obtain a product of a constant boiling point. The specific gravity at 0° C., of the different portions ranged between ·7136 and .7444; he also ascertained the specific gravity of their vapor and their expansion, and comes to the conclusion that they are composed in accordance with the formula C_nH_n. Sulphuric, nitric and muriatic acids do not react with them; picric acid yields unstable compounds; chlorinated compounds, which however, could not be obtained pure, were obtained with chlorine and with perchloride of phosphorous. Dr. E. has operated with the distillate obtained below 130° C.—(Vol. cxiii. 161—183.)

To transform Lactic into Propionic Acid.—E. Lautemann, (Ann. d. Ch. and Ph. cxiii. 217–220,) saturated diluted lactic acid (with 1 volume of water,) with hydriodic acid, and heated the liquid in a closed tube to 140° C. Neutralized with KO, distilled with SO_3, and treated with AgO, CO_2, propionate of silver was obtained on evaporation. If 3·5 parts of lactic acid are diluted with little water, and four parts of biniodide of phosphorus added, propionic acid with some iodine distils over.

The conversion of Lactic Acid into Alanin has been effected by Prof. H. Kolbe, (Ann. d. Ch. and Ph. cxiii. 220—222,) by distilling the limesalt first, with pentachloride of phosphorus, and treating the product with absolute alcohol. This chloropropionic ether is heated with concentrated ammonia for several hours in a closed tube to 100° C., evaporated, acidulated with muriatic acid, exsiccated, exhausted with hot alcoholic ether, the tincture boiled with water, treated with freshly precipitated oxide of lead, then with sulphuretted hydrogen, it is now evaporated and recrystallized. If basic nitrate of lead is employed, the result is large crystals of nitrate of alanin.

Preparation of Lactic Acid.—Lautemann alters Bensch's process (see Gmelin's Handbook, Cavendish edition, xi. 475,) by using sugar, tartaric acid, milk and cheese, as directed by B., ⅓ more of water, and instead of chalk, ordinary white zinc; the temperature ought to be kept at from 40 to 45° C. (104 to 113°F.) and the mixture frequently agitated; lactate of zinc crystallizes in from 8 to 10 days. The whole is heated to boiling, filtered, evaporated, again filtered and after crystallization, recrystallized; the lactate is then dissolved in boiling water and decomposed by sulphuretted hydrogen; the acid liquor is evaporated, and freed from mannite by dissolving in ether and distilling it off.—(Vol. cxiii. 242, 243.)

Decomposition of Carbonic Acid by red hot Copper.—Lautemann confirms Perrot's observation that pure metallic copper does not decompose carbonic acid, which is reduced to carbonic oxide by the presence of some iron or zinc.—(Vol. cxiii. 238, 239.)

Volatility of Phosphoric Acid.—Anhydrous phosphoric acid volatilizes, according to Lautemann, when heated in a test tube over an ordinary spirit lamp, with the exception of a small portion which combined with the constituents of the glass.—(Vol. cxiii. 240.)

Electrolytic Observations.—Prof. H. Kolbe found that succinnate of soda yields, on the positive pole, carbonic acid and oxide of methyle; lactate of potassa, however, carbonic acid and aldehyde.—(Vol. cxiii. 244.)

On Copal Resin.—Before copal is used for the preparation of varnishes, it is subjected to a partial dry distillation; Manilla copal yields a dark brown; African copal a greenish distillate, containing copper from the retort. This distillate contains an acid, copalic acid, which has not been obtained in a pure state, several oils and a tarlike body. Prof. J. J. Schivler, found the oil rectified between 160 and 165° C, to be of a pleasant odor, very disagreeable taste, and the composition $C_{20}H_{16}$; the oil boiling above 215° contained 15·6 per cent. oxygen and proba-

bly consists of a mixture of various compounds.—(Vol. cxiii. 338—349.)

On Acrolein.—H. Hübner and A. Geuther prepare it from 1 part glycerin, with 2 parts bisulphate of potassa, by distilling to dryness; the yield is 25 to 28 per cent. anhydrous acrolein, boiling at 52.°4 C. (126.3 F.) By treating with pentachloride of phosphorus, the bichloride of acrolein $=C_6H_4Cl_2$ is obtained, being a colorless oily liquid, boiling at 84.°4 C., (184° F.,) of 1·170 specific gravity, at 24.°5 C, and of the odor and taste of chloroform. Acrolein yields with ammonia a solid compound $C_{12}H_{10}NO_3$, in appearance like coagulated albumen, which most likely is an ammonium base. Anhydrous acetic acid combines with acrolein to an oily liquid of 1·076 specific gravity at 22° C., possessing a strong fishy odor and a very sharp taste.—(Vol. cxiv. 35—51.)

On the conversion of Malic and Tartaric Acids into Succinic Acid.—Succinic acid $2HO, C_8H_4O_6$ differs from malic acid $=2HO, C_8H_4O_8$ and tartaric acid $=2HO, C_8H_4O_{10}$ by containing 2O and 4O less. R. Schmitt (Ann. d. Ch. and Ph. cxiv. 106—111,) converts both these latter acids into the former by saturating concentrated hydriodic acid with pure malic or tartaric acid, and heating the solution in a sealed glass tube, the former to 130° C., the latter not over 120° C. In about eight hours the reaction is completed. The liquid or the crystals are now boiled in a retort with water until iodine ceases to pass over; the residue from evaporation is treated with a little ether, to remove the last traces of iodine, and then recrystallized from water, or, in order to remove some tartaric acid, from boiling ether. The crystals consist of pure succinic acid.

On the use of Gun-cotton.—At ordinary temperature, gun-cotton is not affected by nearly all the strong chemical agents. Prof. Boettger recommends it on this account, for the filtration of strong acids, of liquids readily decomposed by organic substances, &c., for which purposes it is superior to asbestos, granites, glass, &c. He has employed it for the filtration of nitric, fuming sulphuric, nitro-muriatic and chromic acids,

permanganate of potassa, concentrated leys, &c.—(Vol. cxiv. 111, 112.)

Nitrobenzole from oil of Turpentine.—The residue from the influence of concentrated nitric acid upon oil of turpentine, when mixed with sand and subjected to dry distillation, yields a brown oil, from which between 200 and 220° C., much nitrobenzole is obtained. Schiff converted it by zinc and muriatic acid into anilin, which was recognized by chromic acid and chloride of lime.—(Vol. cxiv. 201.)

A NEW ALKALOID IN COCA.

Coca is the name under which the leaves of several species of Erythroxylon are and have been known in Peru from time immemorial, and which, especially among the Indians, are used for chewing, mixed with a little unslacked lime or wood ashes. Numerous and somewhat fabulous accounts are given of their physiological action, as for instance in "Tschudi's Travels in Peru." A moderate use is said to produce excitement of the functions, to enable the chewer to remain some time without food, and to bear the greatest bodily exertions; while an immoderate chewing of coca, like that of opium, frequently becomes an habitual vice, producing all the deleterious symptons and consequences of narcotics, such as a state of half intoxication, half of drowsiness, with visionary dreams, premature decay, complete apathy, and idiocy. These peculiar symptoms rendered the presence of a narcotic principle very probable, and have induced Prof. Wœhler and Dr. Niemann, of Goettingen, to undertake the investigation of the substance. The material was furnished by Dr. Scherzer, the naturalist of the exploring expedition in the Austrian frigate Novara. The examination has so far succeeded, by the usual method for the separation of alkaloids, in eliminating a crystallizable base, *cocaïne*, crystallizing in small prisms, devoid of color or odor, slightly soluble in water, more readily in alcohol, and very easily in ether. It possesses a strongly marked alkaline reaction, and a bitter taste, and acts in so far peculiarly, as it transiently benumbs, or almost paralyzes the

part of the tongue which it touches. It bears some resemblance to atropine in its chemical relations, and forms perfect salts with the acids. It is, however, without action on the eye, and its compound with the chloride of gold is remarkable for forming benzoic acid in large proportion upon being heated. Further experiments will throw light on its physiological properties.—*Druggists' Circular, August*, 1860.

RESULTS OF AN ANALYSIS OF PENNSYLVANIA PETROLEUM,

Especially respecting its value as a source of hydrocarbon oils, adapted to the purposes of illumination.

By E. S. Wayne.

The recent discovery in Western Pennsylvania and Eastern Ohio of numerous and apparently inexhaustible sources of petroleum, and the bearing it was anticipated to have upon what is as yet a new branch of manufacture (that of coal oil), has made it a subject of much interest and no little anxiety to those engaged in that business.

Through Mr. J. W. Donahue, of this city, I obtained a quantity of Pennsylvania petroleum, sufficient for a practical test of its value, which was sent to him from Holland, Venango county, Pennsylvania. This specimen, which I presume is a fair representation of the quality of it, as obtained from the numerous wells in that locality, was of a peculiar opake, olive green hue; and in odor similar to that petroleum commonly known as Seneka oil, which it very much resembles, with the exception only of its being much thinner in body. Upon testing the specific gravity of it, I found it to be only 815°; much lower than that of Seneka oil and other specimens I had of petroleum, exuding naturally upon Paint Creek, a tributary of the Big Sandy river, Kentucky. Upon exposing a portion of this petroleum to the air, for twenty-four hours, I found that it lost considerable bulk by evaporation, and that it had gained a corresponding increase in gravity, as the remainder upon testing gave 825° specific gravity, ten degrees heavier than the original substance, which was 815°. Ten gallons of this petroleum was submitted to distillation, and the following are the fractional results and specific gravities of the same. The fractions taken of the run of the still

were a pint in volume, and the specific gravity given is the average of that quantity, which was a mixture, more or less, of different gravities, ranging between that next above and below it in the column of gravities.

Per cent. 60° Fah.	Spec. grav. 60° Fah.	
2·50	·668	
1·25	·679	
1·25	·695	
1·25	·705	
1·25	·709	
1·25	·719	
1·25	·724	
1·25	·729	
1·25	·735	
1·25	·741	
1·25	·744	
1·25	·747	
1·25	·749	
1·25	·754	
2·50	·761	
1·25	·763	
1·25	·765	
1·25	·769	
1·25	·773	
1·25	·775	
1·25	·778	
1·25	·782	
1·25	·785	
2·50	·787	
2·50	·791	
1·25	·799	
1·25	·801	
1·25	·803	
1·25	·806	Total quantity within brace, 4 6–8 gallons; having a specific gravity of 809°.
1·25	·808	
1·25	·810	
1·25	·812	
1·25	·813	
1·25	·815	
1·25	·816	
1·25	·818	
5·00	·819	
1·25	·817	
1.25	·815	
1·25	·820	
15.00	*·823	* In this fraction the oil cooled to 40° Fah., became solid from the presence of paraffin.
2·50	·818	
2·50	·815	
2·50	·813	
2·50	·808	
2·50	·815	
2·50	·825	
5·62	·821	
5·00—coke.		
·63—water.		
100·00		

The results of the distillation were very different from what I anticipated, and was led to believe they would be, from a table experiment, the fractions of which were too small to conveniently take. The specific gravity, and the appearance of paraffin towards the latter part of the experiment, caused me to suppose that, from the low gravity of the petroleum, and obtaining paraffin in the distillate, it was a mixture of very light and heavy fluid hydrocarbon only.

In the manufacture of illuminating oil from coal, it is that portion of the product between the specific gravity of ·775 to ·840 only, that makes in every respect a burning fluid; and in the examination of this petroleum, it was my intention to have taken the same range of gravities to test both the quantity it yielded of such, and to test them as regards the illuminating value compared with that of coal oil. It will be seen from the table of gravities above, that there was none obtained higher than ·825, at which point paraffin made its appearance; at that I concluded it would be best not to carry the quantity intended for burning fluid any further, and consequently was disappointed in obtaining a fluid having the same range of gravities as that of coal oil, with which I intended to test its illuminating value. That portion of oil that came over after the above, upon remaining out doors over night, was found to be in the morning full of crystals of paraffin. The quantity, however, is not so large as that present in coal oil of higher gravity. A slight elevation of temperature caused their rapid solution in the accompanying oil; and an attempt at the separation, at present, I found difficult, and shall, at some future time, separate them. The paraffin from this petroleum, I am satisfied, is a very different body to that obtained from coal, both in its chemical composition and physical properties. Its low boiling point, and apparent low specific gravity indicate it.

The distillation commenced with a fluid of very low gravity and exceedingly volatile, and almost colorless. As the gravity increased, it became gradually colored, and the last fractions of it were of a lemon yellow color. The odor of the whole product was similar to that of the original, but more penetrating; by exposure to light, the oil gradually acquired a dark color. That portion of the oil included within the brace, in the column

of gravities, without any purification, was tested as to its burning in a flat wick lamp. At the commencement of the trial, it burnt with a full long flame, but in the course of a very short time it gradually commenced to grow smaller, and in the course of an hour it diminished to about one-third, the wick very much clogged with deposits of carbon, and giving but a feeble red light—this trial proving very unsatisfactory. The oil was submitted to further treatment, with the view of removing from it any or all substances that might interfere with the proper combustion of it; to this end the oil was re-distilled over lime, and then treated with concentrated sulphuric acid and alkali. The product after this treatment was almost colorless, and the greater portion of its original odor gone. This again was tested in the lamp, as in the first instance. The commencement of the combustion was all that could be desired, but the extent of flame rapidly decreased, and at the end of an hour the flame had fallen off to not more than a third of its original size. The only difference observable between it and the former trial, was the absence of carbon deposited upon the wick. One thing is observable during the combustion of this fluid, that the wick is rapidly consumed, and to throw the same extent of flame as obtained from coal oil, a much greater elevation of it is required. That the cause of the rapidly diminishing flame is from the shortening of the wick, is very obvious, as a tolerable extent of flame may be kept up by elevating the wick as the flame diminishes, which in domestic use, would be very troublesome and inconvenient.

The product from this specimen of petroleum, it will be seen from the above, is not in every respect a good burning fluid, as it does not give a constant flame, and rapidly burns away the wick, rendering frequent trimming and elevation of it necessary, to obtain a good illumination from it, which is a peculiarity difficult to account for. My impression is, that it arises from a deficiency of carbon, and think that an ultimate analysis would demonstrate that it contains a smaller per cent. of carbon than coal oil, or products obtained from petroleum, having a higher specific gravity. Such has been my experience in regard to petroleum, i. e., the higher the gravity of the crude material, the more valuable the products both for the purposes of illumination and lubrication.

Petroleum, compared in value with crude coal oil, as a source of illuminating fluids, is a question of much interest, and as far as this specimen is concerned, not difficult to decide. Volume for volume, it certainly yields a much larger per cent. of oil within certain gravities, than crude coal oil from Western Cannel coal. The loss in and expense of refining, is also much less than that of coal oil. But respecting the value of the true hydro-carbons, that from coal possesses, in every respect, a decided superiority.—*The Druggist, Cincinnati, June* 15, 1860.

STATISTICS OF THE INDIGENOUS ROOTS, BARKS, ETC., AND THEIR PRODUCTS.

The value of correct and reliable statistical information can not be too highly estimated; and as but few persons, even here, are aware of the extent of the trade, manufacture, and use of the medicinal plants of the United States, and especially those of the Mississippi Valley, we have compiled the following table, showing the amount of this business in Cincinnati. Our information has been obtained from the most reliable sources, and we fully believe our estimates are rather under than over the maximum quantities.

There are in this city four laboratories, at which the resinoids, extracts, and fluid extracts are manufactured on a large scale; and in addition, several of the druggists and apothecaries prepare considerable quantities of them.

In this table we have not included any articles but those actually used for medicinal purposes, and have even rejected ginseng, about 50,000 pounds of which are annually received at this port.

Table of Resinoids, Extracts, etc., manufactured at Cincinnati for the year, ending May 1*st*, 1860.

Resinoids,	150,000 ounces.
Extracts, Inspissated Juices, etc.,	26,500 pounds.
Essential Tinctures,	4,000 "
Tinctures, Syrups, etc.,	50,000 "

Of Podophyllin and Leptandrin, about equal quantities are prepared, and the two constitute more than one-half of all the resinoids produced.

For the preparation of the above-enumerated articles, at least 250,000 pounds of the roots, etc., are required.

The sales of the crude, bruised, and powdered roots, barks, etc., we estimate at 310,000 pounds, making an aggregate of 560,000 pounds, sold and manufactured in this city during the year; the average value of which can not be less than one hundred and fifty thousand dollars, giving employment to a large number of persons, who are engaged in the collection, drying, and manufacture of these home productions.

The cities of Pittsburgh, Louisville and St. Louis, are also largely engaged in this business; and in addition, a very considerable amount of the roots, barks, etc., are shipped from the various smaller points: and we think we may safely say, that there are not less than one million pounds of these indigenous medicinal agents disposed of annually.

This comparatively new, but valuable and interesting branch of trade, is so rapidly increasing, as to lead many to fear that unless cultivation is resorted to, the country, extensive as it is, will, in a very few years, fail to supply a sufficient quantity of some of the articles, to answer the demand.—*The Druggist, Cincinnati, June* 15, 1860.

CASSAVA BREAD, PREPARED FROM THE ROOT OF CASSAVA PLANT.

Janipha Manihot. (*Euphorbiaceæ.*)

By Mr. F. A. Davson.

There are two distinct varieties of the cassava plant—the bitter and the sweet. The root of the bitter cassava is large and tuberous, abounding in a milky juice. It can with difficulty be distinguished in appearance from the root of the sweet cassava; it does not, however, possess that tough, fibrous, and woody filament contained in the heart of the sweet cassava root. The sweet cassava root, although resembling that of the bitter in external appearance, unlike the latter, is not poisonous.

The plant of the sweet variety grows to about the altitude of four feet, the length of the root is about a foot, it is seven or eight inches in circumference, and of a lightish-brown hue.

The plant of the bitter cassava is generally six feet in height,

the leaves are of a darker green, and the stem of a dark-brown color. The roots require a somewhat longer period for coming to maturity, and are much larger, being about twenty inches in length, and ten in circumference. The sweet cassava is used throughout the colony of British Guiana as a vegetable, either boiled or roasted. When boiled and mashed with fish and meat, it makes excellent soup. From the farina of this root tapioca is prepared.

The bitter variety is cultivated to a great extent by the Indians. It is from this that they produce cassireepe and cassava bread, both of which appear indispensable to their subsistence. The details of the process for making cassava bread vary in different localities. In the British colonies, the root is first washed, then grated on a board stuck with small sharp-edged pebbles or fish bones, or a coarse tin greater is used for the purpose. The Brazilians use a hand-mill for grating the roots. The roots are thrown into the portion of the mill adapted for the purpose, the handle is turned, and the grated portion falls out of an aperture beneath, into a tub or other vessel placed below for its reception.

Edwards, in his *Voyage up the River Amazon*, talks about the roots being grated upon stones. The grated portion is then packed into a matapa, an elastic basket made of wild cane (from five to six feet in length, and three to four inches in diameter), each end terminating in a handle. When sufficiently packed, the upper handle is hung on a cross-beam of the banab (Indian hut), and through the other handle is fitted a heavy piece of timber, the end of which rests on the ground. The pressure on the timber, which is generally produced by sitting upon it, causes the milky fluid to flow out from the interstices of the matap. This liquor, called "cassava water," is very poisonous, causing animals who drink it to swell to a great size, and die within a few hours. After depositing its starch, which it does quickly, it is boiled until it assumes a deepish brown color, and is of the consistency of treacle. On being boiled, the poisonous qualities (hydrocyanic acid among them) are entirely dissipated, and the liquor is known under the name of cassireepe, which is said to enter into the composition of many of the English sauces. The Indians of Guiana mix a small por-

tion with water, and boil with it a quantity of peppers, which renders it excessively hot; into this they dip their meat and cassava bread at meals. The colonists use the cassireepe for flavoring soups, in made dishes, and in making the far-famed "pepperpot," consisting of fish, meat, or fowl, or some of each, boiled with the cassireepe and peppers.

The residue in the matapa is spread out in flat cakes, upon round iron plates of different sizes, and baked over a wood fire. The bread should be perfectly white, not suffered to burn, and when obtained, kept perfectly dry in a tin box or canister. The more civilized inhabitants of the tropics (perhaps I should be better understood if I were to call them Europeans) are not satisfied with eating the cassava as obtained after baking, but have it toasted and buttered, which greatly improves the flavor, and gives it a pleasant crispness. The grated cassava bread is often used in preference to crumbed bread, for different purposes. The bread may be obtained from both plants; but, as a rule, that commonly used is prepared from the bitter cassava root, and the root of the sweet cassava is used in the production of tapioca. The cassava bread of the Indians is much thicker and sweeter than that prepared by the colonists. The cassava is propagated by cuttings, growing to the altitudes already mentioned. Almost every leaf has one or more excrescences, about half an inch long.

Piawarri, an intoxicating liquor, is made by steeping cassava bread in water. The Indians, who are the only manufacturers, use a long narrow trough or boat, hollowed out of the trunk of a tree. In order to ferment this liquor, several old Indian squaws, almost toothless, assemble round the boat with a quantity of cassava bread, which they chew till well mixed with saliva, and spit out into the trough. In a day or two it is in a perfect state of ferment, and ready to drink. Piawarri is not commonly made as a beverage, but only on special occasions. When an Indian chief dies, he is buried in the village, and the other Indians quit the place immediately, leaving all their implements of chase and husbandry and food behind them. Twelve moons are allowed to pass over, when all the Indians of the chief's tribe assemble at the deserted village to feast and dance the "Macquarrie Whip-dance." Piawarri being

prepared, a long banab is erected, in the middle of which the boat is placed with the intoxicating liquor. Each Indian marks his body over with roucou (*i. e.* annatto) and lana dyes, and ornaments head, legs, and arms with the blue, red, and yellow feathers of the parrot and macaw. Each is provided with a whip about three feet long, the plaited thong of which is made from the silk grass, ornamented with small bunches of dried dyed grass; this is called the "Macquarrie whip." When sufficient numbers have assembled, and the sun has sunk behind the trees, the dance commences. They arrange in two opposite lines, as for a country dance. One commences, and after a few manœuvres, firmly plants one leg forward. The opposite Indian takes quick aim, and with his whip lashes the calf of the leg, frequently inflicting a deep cut; each Indian dances thus down the middle, presenting his leg to every Indian present for the lash. When excitement and howling are at its height, one leads off to the piawarri boat, and they dance in single file round and round, the women filling calabashes with piawarri, and presenting it to the men. The dance lasts sometimes for three days and nights. The evil spirit is supposed to be driven away from the chief's grave. The Indians return to their homes, and never again go back to the spot.

Having been some years absent from the colony, and having left at too early an age to take much interest in the produce of my birthplace, in a commercial point of view, I do not know whether cassava bread is imported commercially into this country; I am, however, inclined to suppose it is not, from never having met with it at all in England, nor heard of its exportation from the British colonies; and my familiarity with that tropical staff off life was only renewed last week, when a box of it was brought over for private consumption from my home in Berbice. The cakes were closely packed in a deal box, and covered up in brown paper; they arrived, after three weeks' voyage, perfectly white, in excellent condition, and in every respect equal, doubtless, to what is produced every day in the colony. A few years before I left the colony a few pounds of the dried sweet cassava root were sent over to England from Jamaica to ascertain whether it would prove profitable, if greater amounts were exported, as articles of commerce. Some of

the specimens were perfectly white; in others, however, the worms had made some way in their repast before they arrived in England, and the greater number of samples were scorched and burnt by some accident or carelessness. This was hardly a way to procure custom. Had good specimens of the bread, as it should be prepared for the table, been sent over, the article undoubtedly would have met with a more welcome reception. It is not, however, too late to try the experiment again, the more especially as the specimen recently imported is everything that can be desired. The bread, being abundant, is cheap, and may be purchased at the rate of fourpence for a dozen cakes. It is also light, farinaceous, and pleasant to the taste, and altogether worthy of obtaining a high place among the luxuries of the English tea-table.

I have no doubt but that when emigration becomes more a matter of consideration in this country, and Europeans begin to believe that British Guiana is not such a seat of slavery and yellow fever as is commonly supposed, and when we gain the labor, which is all that is required, and when the produce of that territory is brought more before the British public than it has hitherto been, the colony will become a very important one; for there are many products of that fertile land, of which the European knows little or nothing; some he may know by name, and of others he has only seen small samples. No country on the surface of the globe can be compared with Guiana for its vigor and luxuriance of vegetation. There is a constant summer, and the rich soil, humid climate, and congenial temperature, insure an immense and rapid growth of vegetation, and a continued succession of leaves, flowers, and fruits. But I must not stray from the subject of the cassava to other products; for I should be led away to numbers indefinite, of which my faint recollection has but left me a limited knowledge. As I am, however, likely to return to the colony, I hope to be one of those who are doing their utmost to bring the products of the West before the public of this country.—*London Pharm. Journ., July* 2, 1860.

ON THE DETECTION AND ESTIMATION OF PHOSPHORUS AND PHOSPHOROUS ACID.

By Prof. Scherer.

Within two years the author had occasion to gather much experience from a number of cases of poisoning of animals, and of two men, also from several attempts of poisoning by phosphorus. In one case, the phosphorus from 30 to 40 matches, equivalent to about ½ grain, proved fatal to a woman in 48 hours. He establishes the presence of phosphorus by Mitscherlich's method, with the modification of filling the apparatus with carbonic acid, generated from a few pieces of calcareous spar introduced into the acid liquid. No luminous vapors are obtained, but little of the phosphorus is oxidized, and if the tube dips into distilled water, this is phosphorescent when agitated in the dark, and its vapor blackens nitrate of silver.

To estimate the phosphorus, the last bottle containing the water, is connected with another vial containing either neutral or slightly ammoniacal nitrate of silver, which absorbs all the phosphorous vapors that have not been retained by the water. Any globules of phosphorus which may have been obtained, are fused together and weighed; the water is added to the silver solution, nitromuriatic acid is added and then evaporated, the chloride of silver is filtered off; the phosphoric acid, which is contained in the filtrate, is estimated in the usual manner and calculated for phosphorus.

Very minute portions of phosphorus may be recognized, after first ascertaining the absence of sulph-hydric acid, the vapors of which will turn sugar of lead paper black, and paper moistened with nitroprusside of sodium blue; papers moistened with nitrate of silver are suspended over the acid liquid, which is gently heated; in the presence of phosphorus, the silver will be reduced with a black color. The papers may now be macerated in chlorine water or aqua regia, the filtrate will, after evaporation contain phosphoric acid, to be recognized as ammonio-phosphate of magnesia, or as phosphomolybdate of ammonia.

If phosphorus has been wholly or partly converted into phosphorous acid, the residue from the first distillation is heated in Mitscherlich's apparatus with sulphuric acid and pure zinc, un-

til the hydrogen ceases to be contaminated with phosphuretted hydrogen, which is conducted into the silver solution and estimated, as indicated before.—(*Annalen d. Chem. und Pharm.* cxii. 214—220.) J. M. M.

DEATH FROM AN OVERDOSE OF CHLOROFOM.

An inquest has been held at Doncaster, on the body of Frances E. N. Mansell, wife of a commercial traveller in that town. The deceased had been for years in the habit of taking chloroform; and notwithstanding that both her medical attendants and her husband had used all means to prevent her obtaining it from the druggists, she was supplied with no less than five ounces on one occasion. She used an ounce at a time, and on each occasion she went to bed, her daughter, only ten years of age, attending upon her, and removing the cloth (upon which the chloroform was poured) from her mouth when she thought she had inhaled sufficient. The deceased took the last dose at ten o'clock, having procured it a short time before, and at eleven o'clock the children, who were alone in the house, found her dead. From the examination of witnesses, it was shown that the deceased had procured the chloroform from Mr. Martin, druggist, against the wish of her friends. The jury returned a verdict that the deceased had died from an overdose of chloroform incautiously taken, and they further added, "The jury cannot separate without strongly censuring Mr. Martin for persisting to supply the deceased with such a dangerous agent after the repeated warnings of Mr. Moore, one of the medical men, and Mr. Mansell; and the jury further recommend that in any future bill for the sale of poisons, chloroform be included under the same restrictions as other poisons."—*London Pharm. Journ. July*, 1860.

ROTTEN STONE.

This is a useful yellow-colored substance much employed in scouring brass and tin by mixture with a little sweet oil, then finishing off with some dry whiting. Very few persons know where it comes from, or of what it is composed. According to Professor Johnstone, it is composed of silica, alumina and carbon. It is obtained from a ridge in Derbyshire, England, which is covered with drift 10 or 20 feet thick, consisting of brown clay, with manes of black marble, chert, and rotten stone. The rotten-stone is so soft whilst in the soil that the spade goes through it readily, but it hardens on exposure; the holes from which it is dug are only two feet deep in some places; at others, from six to eight. On examining a series of specimens, Professor Johnstone found that while some were homogeneous, others had nucleus of black marble. He then treated specimens of the black marble with weak acid, and found that on the removal of the carbonate of lime, there remained from 15 to 20 per cent. of a silicious substance perfectly like the natural rotten-stone. He concluded that there existed in the soil some acid which penetrated it and dissolved out the calcareous matter of the rocks below. The agent in this case might be the carbonic acid of the air, brought down by rain; but there were instances not capable of explanation by this agency alone, and attributable to other acids, which are produced under certain conditions, and exercise a much wider influence. The bottoms of peat bogs present very strong evidence of the action of acids; the stone and clay are bleached and corroded, only silicious and colorless materials being left. The source of the acid here the same as in the former instance; the vegetable matter growing on the surface produces in its decay substances which exert a chemical action on the subsoil, and escape by subterranean outlets, carrying away the materials dissolved in their progress. Another instance was afforded by the mineral Pigotite, formed in the caves of Cornwall by water dripping from the roof. This water contains a peculiar organic acid, derived from the soil of the moors, which dissolves the alumina of the granite and combines with it. The organic acids are very numerous and different in composition, but agree in producing chemical action upon rocks. They

are produced over the entire surface of the earth, especially over uncultivated tracts, and are the means provided by nature to disolve the mineral food of plants; they are also amongst the chief causes of the exhaustion of soils. In the green sandstone strata of Surrey, England, known as "firestone," the rock is light and porous, and contains silica in a soluble state. Common sandstone quartz or rock crystal is not acted upon by potash or soda at ordinary temperature, but 30 per cent. and sometimes 70 per cent. of the silica in "fire stone" may be dissolved. In all such cases the silica must have been originally a state of chemical combination with lime, alumina, or something else, which has been subsequently removed. The silica in the rotten stone was soluble, but black marble, in a bedded state, never was found converted into rotten-stone—*Chemical News, London*, July 30, 1860.

COPPER TUBES MADE BY GALVANIC PROCESS.

Le Génie Industriel, publishes the details of a process for making copper tubes without soldering, which consists simply in depositing copper upon lead patterns by the galvanic battery, and then melting out the lead. It is said to work perfectly, and of course tubes could be made of any desired form—straight, curved, or right-angled. This suggests the idea of forming tubes in the same manner with cores of wax or clay. The clay may be forced into the size of the pipe through a draw plate, then allowed to harden slightly, when it may be covered with plumbago and an electro deposit of copper made upon it with a galvanic battery. When the copper is deposited in sufficient thickness the clay may be removed from the interior by boiling the pipe in water. To conduct this manufacture it would require long depositing troughs, and the expense would probably be too great for making strait copper tubes; but for curved tubes, such as the worms of stills, it would perhaps pay. Curved copper tubes are commonly made by filling strait tubes with hot resin, then twisting the entire tube into its curved form. When the resin becomes cool, it is driven out by striking the pipe, which breaks the resin core into small pieces.—*Chem. News, London, May 12th*, 1860.

NOTES ON SOME OF THE DRUGS OF THE LEVANT.

Madder.—Asia Minor, at the present time, produces annually about 60,000 sacks of madder roots, the average weight of which is usually two and a half cwts. each. The principal districts of production are Bakir, Cayagik, Demirgik, Yordes, Caramania, and Allazata. A small quantity also is grown in Syria and in the islands of Imbros and Cyprus. The qualities most esteemed are the Bakir madder roots. These are generally of a bolder and brighter color than the others. Those of Allazata and Cayagik are also of excellent quality. Syrian and Cyprus are the most inferior kinds. But wherever they are grown in Turkey, the roots are forwarded to Smyrna, where they are garbled and packed by means of hydraulic presses into bales, which weigh from six to seven cwts. each.

The crop this year is estimated at about 50,000 sacks, but the quantity is in some measure regulated by the prices. When the prices are low the growers refuse to dig up the roots, and high prices will sometimes encourage them to dig when the roots are only two years old. It is, however, most advisable to allow them to remain in the ground from three to four years, according to the sort. The present value of Bakir roots in Smyrna is 46*s.* 6*d.* per cwt. and of other kinds from 39*s.* to 45*s.* 6*d.* per cwt.

Persian Berries.—The yellow berries, usually termed Persian berries, are grown in Cæsarea; the cultivation, however, is now nearly abandoned, and in a few years the article will probably disappear from commerce. The present price of 38*s.* to 44*s.* per cwt. hardly covers the expense of carriage from Cæsarea, and the heavy duties and tithes, which, although supposed to be *ad valorem*, are levied upon the old price of 7*l.* to 8*l.* Some years ago well grown Persian berries were worth 28*l.* per cwt. The quantity still brought to the Smyrna market is about 1500 sacks annually. The berries are now collected by the peasants on account of the landed proprietors, they receiving in payment one half the quantity.

Opium.—This narcotic is now being collected. The crop this year is unusually large, and is expected to reach 3600 baskets,

of about 140 lbs. each, the average production being 2500 baskets. No price has yet been fixed, but it is expected that 18s. per lb. will be about the figure at the commencement of the season. The average consumption of different countries is as follows :—

England	400	baskets.
America	900	"
China	1000	"
Java	500	"
Borneo	100	"
France	80	"
Germany	60	"

The above figures, however, vary considerably according to price, particularly with regard to the exports to China.—*Lon. Chem. News, July* 7, 1850.

Varieties.

Vegetable Tallow.—The Agricultural Bureau of the patent office has received specimens of vegetable tallow, known to botanists as *myristica sebifera.* It comes from a nut about the size of a nutmeg, full of meat, which being melted, becomes a yellowish tallow excellent for candles. The plant is a native of Central and South America, and naturally attains a height of 10 or 12 feet; it carries herbaceous flowers from July till September, and makes so profuse a secretion of oily matter, that this may be readily obtained from it, in the form of fat, by immersing it in boiling water. H. L. Clarke, Esq., United States Minister at Guatemala, writes that he has no doubt that this article might be collected and exported at considerable profit. It grows in immense quantities in the southern departments and in Verapaz. It is susceptible of such high purification as to resemble the finest sperm, is solid, and quite as transparent. A sample of this production, in the nut and in the tallow, is now among the numerous collections at the patent office. The cultivation of it from the seed will be tried at the horticultural garden.—*Chem. News, London, June* 2, 1860, from *Scientific American.*

New Way to discover Leaks in Gas Pipes.—The usual way of looking for them with a lighted candle our readers know sometimes results in an ex-

plosion, a fire, and one or two deaths. Now M. Fournier suggests another way, which is very simple, and perfectly safe. He charges the pipes with ammoniacal gas, and then goes along them with a bottle of hydrochloric acid. Our readers know the rest. M. Fournier claims one of the Monthyon prizes for his invention.—*Chem. News, London, June* 23, 1860, from *Cosmos, Liv. xix.*, 1860.

Cast Platinum.—At the last sitting of the Academy of Sciences, MM. Deville and Debray exhibited two ingots of platinum weighing together a little over 55 lbs. av., which had been melted in the same furnace, and run into an ingot mould of forged iron. The furnace used was that described in the Chemical News, Vol. 1, page 6. The authors announce that platinum may be melted in any quantity, and once melted it behaves precisely like gold or silver, requiring exactly the same precautions as in casting the precious metals. They also exhibited a platinum cog-wheel, cast in an ordinary sand mould, in the same way as other metals, thus giving a new proof of the possibility of giving platinum all the forms that may be desired by their process.—*Chem. News, London, June* 23, 1860.

Gas Leakage Nuisance.—It is reckoned that about 386,000,000 of cubic feet of gas escape per annum in the metropolis—or, in other words, that about 1,000,000 cubic feet a day of that delicious vapor is let loose in an unburned state upon London society. Some authorities reckon the quantity at about 2,000,000 feet per diem. The loss in hard cash comes up to about £50,000 per annum.—*Am. Med. Times, New York, July* 14, 1860, from *Med. Times and Gazette.*

Glycerole of Kino.—Dr. William S. Love has handed us a specimen of the above preparation in the proportion of two drachms of kino to the fluid ounce of glycerin. Dr. Love suggests this preparation as a substitute for tincture of kino in cretaceous mixtures: it mixes readily with water, forming a transparent solution, and seems to be a permanent preparation, as he has kept it for a considerable length of time without apparent change.—*Jour. and Tr. Md. Col. Pharm. March,* 1860.

Ginseng.—A letter from St. Petersburg, dated 24th December, states that a scientific expedition has been organised, under the direction of M. Maak, to describe the interesting valley of Oussory, as well as the south-east of the Mantchoo territory to the frontiers of Corea, and to examine specially the ginseng (a renowned medicinal plant,) to study the geographical extent of the Mantchoo territory where this plant is propagated, and particularly the places in which it grows naturally, and to examine and describe the plantations of the Chinese who cultivate it. A great number of Russians propose to establish plantations of ginseng as an important produce for trade with China.—*Pharm. Jour. London, Feb.* 1, 1860.

Editorial Department.

MEETING OF THE AMERICAN PHARMACEUTICAL ASSOCIATION.—This important body will convene this year in New York. So far as can be now judged, the indications are favorable to a large and interesting meeting. It is desirable that members should make a little sacrifice to get there, and those who are not members should take advantage of this opportunity to join the Association, to mingle with our New York brethren, and visit the attractions of the great commercial metropolis. The following is a copy of the Treasurer's annual circular:

Boston, August 11th, 1860.

The next meeting of the Association will be held on the second Tuesday of SEPTEMBER (11th), 1860, at 3 o'clock, P. M., at the Hall of the University Buildings, on Washington Square, New York City.

The LAFARGE HOUSE, 673 Broadway, convenient to the Hall, has been selected as the rendezvous of the Association, when not in session, and the home of those not residents of New York, ample accommodations for the purpose having been secured by our New York friends, at a reduction from usual rates.

All members, and persons intending to become members, are requested to report themselves at the Hall of the University Buildings, Washington Square, and at the Hotel.

Members are requested to forward the names of their friends whom they wish to propose for membership, so that they may be elected at the first session of the next meeting.

Members will confer a favor by notifying the Treasurer of the decease of any member during the last year.

Suitable arrangements will be made for the exhibition of specimens at the meeting.

From the manifestly increasing interest in the Association, a large attendance is expected, and it would be very gratifying to meet every member, and all Pharmaceutists who are interested in our objects.

ASHEL BOYDEN, *Treasurer*,
Myrtle, cor. Joy Street, Boston.

DR. COATES' ADDRESS.—In noticing a part of this Address, as our record will show, we did not intend, much less expect, to excite the display of feeling and asperity manifested in the following letter. The author, wholly misunderstanding the tenor and spirit of our criticism, has allowed himself, we fear, to be influenced by the spirit that he fancied had dictated our remarks; and no doubt honestly feels himself aggrieved. As we hate injustice, and do not like even to be misunderstood as countenancing it, we are induced to admit the letter to our pages, (much against our sense of its necessity,) as the author has desired it: but we accompany it with the statements—1st, that there is but one editor of the American Journal of Pharmacy; 2d,

that it has not been usual with us to send copies of our Journal to authors of reviewed books or articles, unless requested, and hence we did not intentionally neglect Dr. Coates; 3d, that our remarks were directed to the subject matter of the Address, without any unkind feeling against the author, and that we have no where attributed "*improper motives*," or have spoken disrespectfully of him, or given just cause for the sharp language of his reply.

With these necessary explanations, and without feeling it needful to alter our record, or to enter into any defence, we submit the letter to the perusal of such of our readers as feel disposed to occupy themselves with it, believing that a due appreciation of the ejaculation of the poet,—

"O wad some Power the giftie gie us
To see oursels as others see us!
It wad frae monie a blunder free us
An' foolish notion,"

—would have saved the author much irritation and "vexation of spirit," and have given our readers full five pages more of profitable "Varieties," which have necessarily been excluded.

To the Editors of the American Journal of Pharmacy:

GENTLEMEN,—I am induced to the unusual course of replying to a review by circumstances which seem to call for it, and to make the case exceptional; and these I now propose to enumerate.

Such replies, no doubt, are often a waste of labor, or worse; but it appears to me that I have been held up to the apothecaries of Philadelphia, in your recent May and July numbers, as disrespectful and inimical to them, and as using strange liberties of language in speaking of them. Against this I feel the strongest cause to protest, both from natural disinclination to place myself in such a position, from my numerous and valued friendships within the pharmaceutical profession, and from the palpable absurdity of an individual, who obtains his livelihood by the practice of medicine, being willing to make enemies of the apothecaries of the city in which he resides. The call for a reply is, however, rendered still stronger. Direct personal imputations of "excessive professional pride," of a claim to "infallibility," and of an "extraordinary" and "singular" character in a recent address of mine, and in its "language" and "expressions," and of a "liberty" taken in using them, are not enough; but a positive and plain assertion is made of the existence of *improper motives*. All this is brought against me by name, and in reply to a paper which in no instance alludes to individuals personally, or gives any clue by which to identify them.

It seems to me that all the instances cited in my address are handled with tenderness and reserve—at least, it was intended that such would be the case. The effort at delicacy seems to me to be more than was necessary; and I think that some of the instances, at which the address has only laughed, might be made the subjects of a graver censure; the milder form being preferred, as more becoming to citizens, to persons devoted to justice, humanity and science, and to gentlemen.

There was no copy of either of the two reviews sent to me, although an old friendship subsisted between the principal editor and myself; and I am indebted to other pharmaceutical friends for the opportunity of read-

ing them, and even for a knowledge of their existence, and of the times at which, some ten days previously, they had appeared. I hope he received, in due time, the copy of the address which I placed for him in Blood's Despatch, and by means of which I have supposed the reviews to have been written.

The vehemence and harshness of this attack have the more surprised me, as the present is the only instance in which any opinion condemnatory of the address has reached me; and I have even had the pleasure of receiving messages from some of the parties blamed in it, which communications, with limited exceptions, declared to be "of course," are highly complimentary. I have two letters in relation to it from another city, and, as I have reason to believe, from highly competent pharmaceutical sources, and not, as yet, a word of blame. The Society did, certainly, not only "order" the pamphlet to be published, but direct an extra number of copies to be struck off for distribution, avowedly because the members were pleased with it.

Neither can I see why the thunders of denunciation should be levelled with such intensity at me, when, in the same two numbers of the Journal, there are reviews of three criticisms on the restrictions necessary for apothecaries, the one by an author who is named, the other by the legislatures of two States; and in neither of these is there any indignation exhibited, either against the members of another profession, that of the law, or against those with whom we practise so much freedom of speech, our public servants, the law-givers. Is the distinction made against me because I live in the same city? Or is it because I am a physician, and the reviewer believed that his acknowledged labor and abilities had placed the pharmaceutical profession at a "status" superior to that of the medical body, and made it unbecoming for the latter to criticise it at all? Or, was it from some other consideration, which pointed at the present writer as one whom it would be advantageous to attack, and who would be unlikely to retort?

Mr. William Procter, Jr., appears as the responsible author of these two reviews. By his name I have been accustomed to believe that I was reminded of not only a personal friend of many years' standing, but an individual, learned, accomplished, loving truth and science, and endowed with entire delicacy and hatred of injustice. I am still at a loss, after re-perusing both of his reviews and my own paper, to discover the faulty language of which I have been guilty; or in what it is blamable to "speak thus" of the apothecaries of Philadelphia; unless, indeed, the reviewer thinks it improper in me to criticise them at all.

The only suggestion of improper language which I have either thought of myself or heard intimated, in my inquiry, by apothecaries of my acquaintance, as alluded to here, apply to the use of the word Jeshurun, and to the winding up of the remarks about the assault which I conceived to have been made upon a physician in a case which had attracted the attention of the public. I fear some of my critics are not profound in their Bible studies. Jeshurun, in my dictionary, means "the righteous people," or "the upright people," and is applied to the chosen race of Israel. In the other instance, if I used a Scriptural expression of very solemn context, in speaking of the successful defence of a physician whom there was no cause to suspect, the expression was prompted by indignation at what I apprehended to be attempts habitually repeated to throw responsibility, blame and permanent suspicion upon the physicians, whenever such things occurred; both as a gratification of malignity against better, more scrupulous and more painstaking men, and as a convenient mode of directing the public attention in the direction of

people likely to suffer in silence, while the offender might persevere with less labor and no sacrifice, in the pursuit of money.

Yet, when Mr. Procter goes into the analysis of his objections to the address, it is pleasant, nor without some surprise, after such an exordium, to find that he agrees with me in a number of the opinions which I really entertain. Of the questions proposed for consideration by the reader, he omits twelve, quotes seven, and, of these, answers three in the affirmative and two in the negative. Thus, in regard to the use of Latin in naming drugs. to the comparative claims of all well-educated young men, and of those individuals with whose ideas, choice of articles to be used, and degrees of preparation, the practitioner is acquainted, to the easier inspection of a limited number of establishments, to the preference due to those who practise attention and care, and to the moderate limits of the number which the city can support without intermixture of other species of commerce, I feel no occasion to express much dissent from what he alleges.

Yet, although the ignorance or imperfect knowledge of Latin among both our physicians and apothecaries, renders it proper, as was agreed by the practitioners of a preceding generation, to write all directions for family use in English, though addressed to the apothecaries; and although the being united with physicians in the confidential secrecy of a dead and learned language was probably one of the most powerful means which inducted the apothecaries of England into the practice of medicine, yet Mr. Procter ought to acknowledge that any prohibition of the older language is essentially wrong. The power and right to communicate in the language of medicine, ought to be preserved. This negligence of Latin, and introduction into the pharmaceutical and medical professions of unprepared men, is confined, I believe, to the Anglo-Saxons. It is said to have arisen from insuperable difficulty. To achieve what is impossible ought not to be demanded of any man; but the error consists in suffering men who have not overcome a given difficulty to be passed off among those who have done it. With regard to the medical profession, our State Society is engaged, at this moment, in efforts to remove this cause of censure.

To another of the reviewer's decisions, I qualify my assent. In limiting deviations from a trade claim to supply particular parties, the expressions "except in special cases," and "without good reason," may be understood to cover a great deal of ground. Who is to select the cases and decide on the goodness of the reasons? I am under the impression that, as in one of the instances cited briefly in the address, the physician has been held to defend himself before the judgment of the apothecary in his own case. The truth is, that the proper motive in the transaction is the welfare of the patient; and that this claim, as now used and as urged here, is a part of the attempt to subject a conscientious and scientific duty to the laws of trade; to the objections against which, in the much-censured address, I feel obliged still to adhere. It is not just to say that, when we send from one establishment to another, the inference is conveyed, "that the apothecary does not understand his business." It is notorious that the apothecary does not, and perhaps cannot, keep all the best articles; and that these may often be obtained in particular localities. It is also true that some apothecaries, more than others, abstain from levity and talk while putting up drugs, and from the sale of non-medical articles.

With regard to "motives," I think sufficient such are obvious. The paper was read before a medical society; and on the Events of the Year,

one of these which had most interested and agitated the public and pained the medical mind, was a recent occurrence at an apothecary's store. Things of this kind have seldom reached my ears for a long time past, without being used as the occasion to make furious attempts to throw the blame upon physicians. In this instance it gave rise to an earnest and persevering one, from which I had to dissuade a valued friend of my own, to induce the Legislature to prohibit the use of the Latin language in prescriptions. He who runs may read that there was here understood and favored a belief in the minds of the public that physicians were to blame in the matter, and that a pompous false pretension, conducted by the use of Latin, was what had produced that and similar occurrences. I need not ask, certainly, how this could be with truth omitted in treating of the medical events of the year.

As Mr. Procter says, "it would not, perhaps, be difficult" to take up other illustrations; but, not feeling inclined to exhibit myself as an adversary of the apothecaries of the city, I will confine this branch of the discussion to the examples which he has given me himself. In these same reviews, there occur a long string of insinuations against physicians. These are exactly cases in point. If the humble individual who now addresses you be ever so much in the wrong, does that give the reviewer any right to retaliate upon other and unoffending men belonging to the same profession? In defending apothecaries, he takes occasion to instruct the public upon the ignorance, carelessness and negligence of physicians; and plainly intimates the position, somewhat incompatible with his present alleged exposure, that the apothecary is bound to exercise a paternal superintendence over our prescriptions, in order to protect not only our patients, but our own characters. The reviewer's opinions on this point ought certainly to be well digested, as he has chewed the cud on them to much extent in his criticism. The idea, however, of violation of confidence, does not seem to have occurred to him.

Let me not be misunderstood. I do not know who those are who "hold that the prescription is always a sufficient warrant 'to blindly dispense' it according to the letter." It is a part of my demand that they should be more carefully examined than they are. Besides being made the occasion of improprieties by some apothecaries, they undoubtedly often contain errors themselves. I will not hold myself responsible for omission of duty, on the part of boards of examiners, who may have granted diplomas without requiring adequate preparation; I will not inquire whether this has never occurred within the more limited circle of the College of Pharmacy. Prescriptions are almost always written under agitation and interruption in families. I am well aware that there is a common-sense, scientific and citizen-like way of acting on this subject; and that it is a thing of strong moral obligation. I only object to airs of superiority, to going out of our own departments of duty, and to that vanity so often mistaken for the loftier sin of ambition, and which so generally leads to "vexation of spirit." The wisdom of antiquity is not of the less value because it is included in the canon of the Christian Scriptures.

It ought to be recollected that where a course of study is so extensive and diversified as that of medicine ought to be, where the members of another profession contract to take the chemical and pharmaceutical part of it off their hands; when chemistry itself has become inexhaustible by any single human brain, and where the principal and prolonged labor ought to be expended upon the human body and its changes, and there is no leisure to spare for unorganized matter, it is not our duty to be so well acquainted with chemistry and the other pharmaceutical ad-

juvants as it is that of apothecaries. The error in naming a drug driven out of use for its acrimony and the variability of its composition, must be confessed to be a just occasion for a small triumph. I never pretended to have an apothecary's familiarity with the mineral salts; and had more of it when, many years ago, I was placed by their then organization as apothecary to the Pennsylvania Hospital, than I have now. The error in memory arose from my having been engaged in introducing, as I did introduce, the precipitated black oxide of mercury into practice in Philadelphia. See paper by Thomas Evans, in an old number of your own Journal of Pharmacy. I then made, tried and relinquished the ammoniacal precipitate from calomel. But which is the more important error, to call a well-known and discarded drug a triple chloride instead of a triple nitrate, or to cause the acrid and uncertain article to be introduced into a sick person's stomach, instead of a mild and uniform one? I grant the critic the advantage that this was, at some time and by somebody, called black oxide, (Merat & De Lens, iii. 364;) but the condemnations in the same page are abundantly sufficient to more than justify the advice to avoid it, given in Coxe's and later Dispensatories. I am certain, at any rate, that I never named any person injuriously, or attempted to lower any person's reputation about it.

From a recent document, I learn that keeping an apothecary's establishment is a "branch of the art of healing." Is making spinning jennies a branch of the cotton manufacture?

The reviewer's censure of the hoaxes practised by members of his own profession, in pages 380 and 381, may be just or otherwise. Of these he is a competent and fitting judge, and I am none whatever.

I nowhere deny the negotiation with the Country Medical Society. Being merely President for the year, and this affair having transpired several years before, at a time when I gave my whole time exclusively to my own affairs, I could not remember unimportant circumstances, which very probably occurrred in my absence. On re-perusal of the authentic documents, the imputation implied in the address, of a fidgetty desire to speak in a dictatorial style to physicians, I confess, still appears to me to be correct. It is not worth while to debate about the difference between "ought to" and "should."

Mr. Procter winds up with apprehensions of disaster to "Philadelphia Pharmacy, if it was regulated by the views of Dr. Coates." As, in the whole address, I have given no views of regulation at all, but only related occurrences and proposed questions for consideration, I do not see how he could state the question, or how he could find out what my views are, when I never expressed any. If we lived in a vulgar era, I should ascribe this to the reviewer's imagination; but in the present day of spiritualism and other illuminations, an old fogey like myself cannot assume that responsibility.

In fine, though Mr. Procter introduces motives, I shall not retaliate by impeaching his own; but I will beg him to examine himself, in order to become certain whether there may not be an unconscious impulse to all this personality and severity, and whether it has nothing to do with sectarian animosity.

B. H. Coates.

The Sunday Closing Movement in Philadelphia.—Some time last spring several young pharmaceutists determined to call a meeting of their fellows, and ascertain whether any steps could be taken which would in-

duce their employers to agree to some arrangement by which their stores could be closed on Sunday, except at certain hours necessary for the supply of the sick. After several meetings at the Hall of the College of Pharmacy, it was determined to draw up an address to the proprietors, asking their attention to the subject, and requesting their signatures to a call for a meeting of apothecaries, at the College Hall, to consider the subject. In this they were successful; the subject met with much interest from a number of pharmaceutists, and at an adjourned meeting held on the 25th of July, the following hours for opening and closing their stores on Sunday were agreed upon by those present:

In the morning, open until 9½ o'clock.

In the afternoon, open at 1 and close at 3 three o'clock.

In the evening, open at 9 and close at 10 o'clock.

It was also agreed that the arrangement should remain in force for three months, commencing after the first week in August, and if found practicable to be continued. Meanwhile the following Address, which was approved by the meeting, was ordered to be extensively circulated.

Address of the Pharmaceutists, to the People of Philadelphia.

The undersigned address you on behalf of the Pharmaceutists of Philadelphia, convened agreeably to public notice July 18th, 1860, to consider and perfect a plan for the relief of themselves and their assistants, from unnecessary labor and confinement on the Sabbath.

The business of the Pharmaceutist involves a constant confinement to the store, required by no other pursuit; besides the ordinary motives of competition, we are under a supposed necessity to provide at the moment for every real or imagined exigency of sickness, so that the dispensing stores in this city, are open on an average from sixteen to seventeen hours daily throughout the entire year, besides being supplied with sleeping accommodations, from which the proprietor or a skilled assistant may be summoned at any time during the hours necessarily appropriated to sleep.

From this onerous confinement to business, there has heretofore been no cessation on the day set apart by the laws of the land, and the practice of nearly all Christian sects, for rest and religious observance. A few pharmaceutists impelled by a sense of duty, have refused to attend to all calls except those of obvious necessity, and a few have absented themselves during the hours of public worship, but the common practice has been to open the stores during the whole day and evening, thus inviting calls of every description, and effectually blotting out the Sabbath from the week of those compelled to be in attendance.

This most unreasonable custom has become almost universal, because its alleged necessity has not been questioned; recently, however, through the general awakening of discussion among pharmaceutists, both in this country and Europe, a professional spirit has grown up which has subjected this and many other abuses to a thorough scrutiny. It has been ascertained that the excessive confinement now complained of, though common in many large cities, is not found necessary in smaller towns, where a few hours only are allowed on the sabbath for the purchase of necessary articles.

Few families in any community are without some of the more important medicines adapted to cases of sudden illness, and which are especially liable to be needed at night, while none in the cities are so isolated as to be unable to obtain them from a neighbor, when the pharmaceutical stores are closed.

Under the earnest conviction that it is a duty we owe to ourselves and assistants, to secure to the fullest extent compatible with the responsible

duties of our profession, that immunity from business which almost the whole community enjoys on the Sabbath, and having obtained the written concurrence of so large a number of the leading pharmaceutists of this city as to make the movement a general one, we have resolved to close our stores, after the first of August next, on the first day of the week, except at the following hours, fixed with special reference to the known requirements of physicians and the public:

In the morning until 9½ o'clock,
In the afternoon from 1 to 3 o'clock,
In the evening from 9 to 10 o'clock.

We trust that this arrangement, which for a few months will necessarily partake of the nature of an experiment, will be acceptable to all concerned, and that it will be cordially entered into in good faith by pharmaceutists generally.

In order to secure its success, and that no disadvantage may result to our customers, we request all to procure in advance those medicines they are most liable to require during the short intervals in which the stores will be closed, and as far as possible to accommodate themselves to the hours above indicated; and to remove still further the possible disadvantages of the arrangement and acquit ourselves of any desire to escape the necessary duties of our profession, we invite customers in cases of urgent necessity which are liable, though very rarely, to occur, to make application at the residence of their Pharmaceutist, or during the appropriate hours, to seek him, as is sometimes necessary in the case of Physicians, at the place of worship to which he resorts.

To medical practitioners we confidently appeal for encouragement in this reform. Their unremitting labors in a profession kindred in its objects to our own, make them acquainted with the peculiar difficulties and dangers which beset our laborious and confining pursuit, and we trust that they will willingly aid this effort to test the practicability of a measure designed to promote the physical and moral well being of those to whom are entrusted so important a department of the healing art.

Finally fellow citizens, having based this movement mainly upon the grounds of justice and expediency, claiming only a share in that day of rest provided by the beneficent laws of our State for "the ease of creation," we cannot forget that there are many who place the obligation to abstain from unnecessary secular employment on this day, on the ground of paramount religious duty; and on behalf of these we claim a still higher consideration and willing acquiescence in the full exercise of conscientious convictions, which, regardless of theological differences, all are bound to respect.

Edward Parrish, No. 800 Arch street.
J. C. Turnpenny & Co., 10th and Spruce sts.
Fred'k Brown, Jr., 9th and Chestnut sts.
J. P. Curran, 6th and G. T. Avenue.
Geo. C. Bower, 6th and Vine street.
Wm. M. Reilly, cor. 2d and Wharton sts.
Henry Mullen, Market and 33d streets.
Wilson H. Pile, Catharine and Pass. Av.
Committee.

The importance of this movement is not to be doubted; the necessity of some reform in the old arrangement will hardly be questioned; yet we do not believe the plan adopted is the best one, or that it will succeed finally, after a trial at all seasons. We believe that the periods of closing will eventually have to be decided by an understanding between physicians and apothecaries, because it really depends on the co-operation of the former, whether the times set for keeping open will meet the influx of prescriptions after their morning and evening visits. We believe

it would have been wise, therefore, to have invited the co-operation of the physicians, so far, at least, as to get a general expression of approval of certain hours. Beyond this a provision should be made for emergencies, by dividing the city into districts, in each of which one apothecary should be open the whole day; the apothecaries of each district taking this duty in some regular order so as to make it but moderately onerous. There are some stores that may enter into this arrangement without any inconvenience to their customers, whilst there are others, whose range of prescription dispensing is very large, that cannot do so at all in its present hours. All these points should be consideredwith an honest purpose of doing the right thing; and above all, let those who feel zealous in the cause of the Sabbath be careful how they judge hastily of their brethren, whose views in regard to duty in this matter may differ from their own.

Since writing the above, we are informed that another meeting is called for August 30th, to re-consider the subject, as, even in the short time that the arrangement has been in operation, difficulties have arisen, which, unless overcome, will defeat the object of the movement.

Pharmacy in Lower Canada.—A member of the Canadian Parliament has introduced a bill for "An act to regulate the time during which Apothecaries and Druggists' shops shall be kept open in the different cities of Lower Canada." This wise legislator wishes to *compel* the apothecaries to keep open shops from 6 A. M. to 9 P. M., from April to November, and from 7 A. M. to 9 P. M., for the remainder of the year, with other analogous regulations applying especially to Sunday. As the *British American Journal* observes: "We wonder that the author of the bill has not gone a step further, and prescribed the particular dress with which the apothecaries should decorate their persons, and the hours during which they should take their meals". The apothecaries in Montreal, have deliberated upon the subject, and at a meeting held on the 24th ult., John Carter Esq. in the chair, the following resolution was unanimously adopted:

"That having carefully considered the act now before Parliament, entitled 'An Act to regulate the time during which Apothecaries and Druggists' shops should be kept open in the different cities of the Province,' this meeting regards the provisons of said act as unjust, vexatious, and highly injurious to the interests of those connected with the said profession, and unnecessary for the public at large; that a petition be presented to the Parliament, praying that the act now before the house, entitled 'Apothecaries' bill do not pass; and that a copy of this resolution be forwarded to the members for the city of Montreal."

Poisonous Hair Dyes.—A correspondent in Woodville, Miss., who had read Prof. Aikin's article in our last number, is desirous that the particular kind of hair dye used should be specified, as he believes "a narcotic of such violence as that described," would be attended with danger in its application to the head.

PAREGORIC.—A correspondent calls attention to the impropriety of many druggists and apothecaries continuing the old practice of using liquorice and other coloring substances in this preparation. The constant association of paregoric and laudanum in the medicine closets, renders it very desirable that they should differ greatly in appearance, to avoid their unintentional substitution, in the often hasty resort that is had to them at night in cases of sickness, or by persons unable to read.

HOPKINS' CHALYBEATE WATER.—We have received a circular in regard to this new mineral water, which informs that the Spring is located about thirteen miles N. E. of Baltimore. Several Baltimore physicians speak of its efficacy as a chalybeate. The following is Prof. Campbell Morfit's analysis:

Chemical Examination of Well Water, from the farm of William Hopkins, Esq., at the head of Saltpetre Creek, Baltimore County, Maryland. Specific Gravity, 1.0003.

COMPOSITION.	PER PINT.	PER GALLON.
Water,	7,290.8092	58,326.4736
Carbonic Acid, partly free,	.3259	2.6072
Carbonate of Protoxide of Iron,	.6360	5.0880
Carbonate of Lime,	.0625	.5000
Carbonate of Magnesia,	.0470	.3760
Chloride of Calcium,	.0707	.5656
Chloride of Magnesium,	.0487	.3896
Chloride of Potassium,	traces	traces.
Organic Matter,	undetermined	undetermined.

A portion of the Carbonic Acid is in a gaseous, absolutely free state, and the Water is therefore a mildly acidulous *Carbonated Chalybeate.*

CAMPBELL MORFIT.

University of Maryland, Baltimore, July 11th, 1855.

PHILADELPHIA COLLEGE OF PHARMACY.—The lectures in the School of this College, open by a general introductory by Prof. Procter, on Monday, Oct. 1, at 7½ o'clock, P. M.

DR. WELLS, THE DISCOVERER OF ANÆSTHESIA.—We have received a pamphlet with the above title, containing the *fac simile* of a letter from the widow of Dr. Wells, claiming for her late husband the honor of the discovery of anæsthesia, in opposition to the claims of Dr. Morton, &c. It is greatly to be regretted that this valuable discovery should be the subject of so much wrangling and ill feeling. Where an idea is gradually developed through the action of several minds, and important results afterwards flow from it, it is natural that each participant in the labor should institute a claim. This affair reminds us of the composition of water controversy in which the claims of Cavendish, Watt and Lavoisier were brought in conflict.

The manufacture of Vinegar; its theory and practice, with especial reference to the quick process. By CHARLES M. WETHERILL, Ph. D., M. D., &c. Philadelphia, Lindsay & Blakiston, 1850, pp. 300, 12mo.

Dr. Wetherill has done a good thing in getting out this little volume. The intrinsic value of acetic acid in its crude form, to the welfare of a nation, is a question that rarely has presented itself bodily to the public mind. The time has long gone by when our farmers, from the excess of their cider, could supply this demand, and long ago chemistry directed its powers to develop from the wondrous processes of the laboratory means to form this useful substance quickly, and succeeded perfectly. The volume of Dr. Wetherill is based on that of Prof. Otto's "*Lehrbuch der essig Fabrikation,*" (1857,) and modified to suit the demands of American manufacturers and circumstances. Dr. Wetherill claims for himself "a practical experience of the manufacture of vinegar," and to have added much to the book that gives it a claim to the attention of the student and the manufacturer. We should be glad to give an extract from the work as a sample of its style, but our space is too limited to permit it in this number; we will therefore refer our readers to the book itself, and suggest that many of our farmers who have material fit for yielding vinegar would do well to avail themselves of the information it presents.

Electro-Physiology and Electro-Therapeutics; showing the best methods for the medical uses of electricity. By ALFRED C. GARRATT, M. D., Fellow of the Massachusetts Medical Society. Boston, Ticknor & Fields, 1860, pp. 708, octavo.

Soon after the appearance of our last number, the handsome volume, of which the above is the title page, was received, and we had hoped to have presented our readers with a notice of it, but it has been found impossible to do it. We therefore present a short bird's eye view of its contents as a notice to attract attention to the work, and leave for our next number a closer view of the subject as unfolded by the author. Dr. Garratt has dedicated this book to John Homans, M. D., President of the Massachusetts Medical Society. In the preface it is especially addressed to medical students. The work is divided into ten chapters; 1st, *Natural Electricity;* 2d, *Early history of the medical uses of electricity;* 3d, Electrical instruments and apparatus for medical purposes; 4th, *Electro-physiology;* 5th, *Methods* for the medical employment of electricity; 6th, *Hyperæsthesia*—exalted nerve actions and pains; 7th, *Anæsthesia*—diminished nerve action and paralysis; 8th, *Spastic diseases—spasms, &c.;* 9th, *Midwifery, abdominal viscera, secretions;* 10th, *Electricity in surgery.* The chapters are illustrated by nearly a hundred wood engravings of apparatus and anatomical parts concerned in the treatment by electricity. The book is elegantly printed on good paper. The novelty of the subject to many practitioners, and its real interest as a new and powerful adjunct to the curative means derived

from medicines, and above all the long and close study which has been accorded to it by the author, strongly recommend the work to the attention of students and practitioners of medicine.

Catalogue of the Phænogamous and Filicoid Plants of New Castle County, Delaware; arranged according to the natural system as recently revised by Prof. A. Gray and others, with the synonyms of modern authors. By EDWARD TATNALL. Published by the Wilmington Institute. Sold by J. T. Heald, Wilmington, Del. 1860, pp. 108, octavo.

This is an important contribution to the local botanical literature of our country. Although embracing but 512 square miles, that county contains over 1100 recognized species and marked varieties, nearly one half as many as are included in the entire flora of the Northern States. Dr. Darlington has expressed his belief that New Castle County possesses a richer flora than any other county in the Union. Its proximity to Philadelphia renders this good news to our young botanists, who have cause to thank Mr. Tatnall for his able contribution.

The Anatomy and Physiology of the Placenta,—the connection of the nervous centres of animal and organic life. By JOHN O'RIELLY, M. D., Licentiate of the Royal College of Surgeons, Ireland; Fellow of the New York Academy of Medicine, &c., &c. New York, Hall, Clayton & Co., 1860, pp. 111, octavo.

The reception of this book from the author is acknowledged.

The Columbus Review of Medicine and Surgery. M. S. McMillen, M. D., Editor. Vol. 1, No. 1, August, 1860, Columbus, Ohio, pp 108.

We acknowledge the receipt of this new Medical Journal, and have placed it on our exchange list.

American Medical Times, being a weekly series of the New York Journal of Medicine. New York, July 7th, etc. Bailliere Brothers, pp. 18, Royal octavo.

In this new form, the New York Journal of Medicine presents a business-like aspect, and looks more like an English weekly than any American journal that we remember. The offer of exchange is accepted.

Georgia Medical and Surgical Encyclopedia, a monthly Journal, edited by Horatio N. Hollifield, M. D., and Tom. W. Newsome, M. D., Sandersville, Georgia. Vol. 1, Nos. 1 and 2. The offer of exchange is accepted.

The Ironmonger, and Metal Trades' Advertiser; a Monthly Trade Circular. London, May 31, 1860, and July, 1860.

This Journal is issued by the proprietors of the "Chemist and Druggist," and got up in the same style. Each number contains 32 pages of short extracts, letters, receipts, etc., having some relationship with the subject in its title, whilst from 60 to 72 pp. are devoted to advertisements, of which a great variety are found. The extract will exhibit one of its features:—

Several veins of nickel, nine inches in depth, are said to have been discovered in Chili. This is the first discovery of this metal in that country so rich in most of the valuable minerals.

By incorporating into melted steel from 2 to 5 per cent. of tungsten, a superior alloy for cutting-tools is obtained. It is dense, hard, and strong, and the tools keep their edge much longer than those made of common steel.

A body falling only one foot strikes with a force eight times its own weight.

The shortest method of calculating the horse-power of engines is to use the unit of 550 lbs. moved one foot per second, instead of 33,000 lbs. one foot per minute.

Fifty years ago a steam engine of 40-horse power cost £4,000.

It is estimated that the annual loss by wear of the gold coinage of the world amounts to £480,000.

Obituary.—Germer Baillière, proprietor of the *Répertoire de Pharmacie*, and noted as a scientific publisher, died at Paris on the 18th of December last. He was born in 1806, at Beauvais, France, and enjoyed a wide reputation for liberality and erudition, in the conduct of his business as a publisher and editor of scientific and medical works.

—— Edmond Robiquet, son of the celebrated Robiquet, and himself one of the most promising pharmaceutical savants of Paris, died on the 29th of April last, after three days' illness, owing to perforation of the intestine. M. Robiquet had only recently received the appointment of Professor of Physics in the Ecole de Pharmacie. He is well known for his researches on aloes, on picric and crysoleptic acids, and on the gallic fermentation, and gave much of his time to improvements in photography, on which art he has left a *Manual*.

—— George W. Smith, for a long period the Secretary of the Pharmaceutical Society of Great Britain, who, since 1856, has been in bad health, died in April last at Brighton. For fifteen years, and during its early and later difficulties, Mr. Smith was an earnest laborer in the service of that Society, and greatly respected by its members.